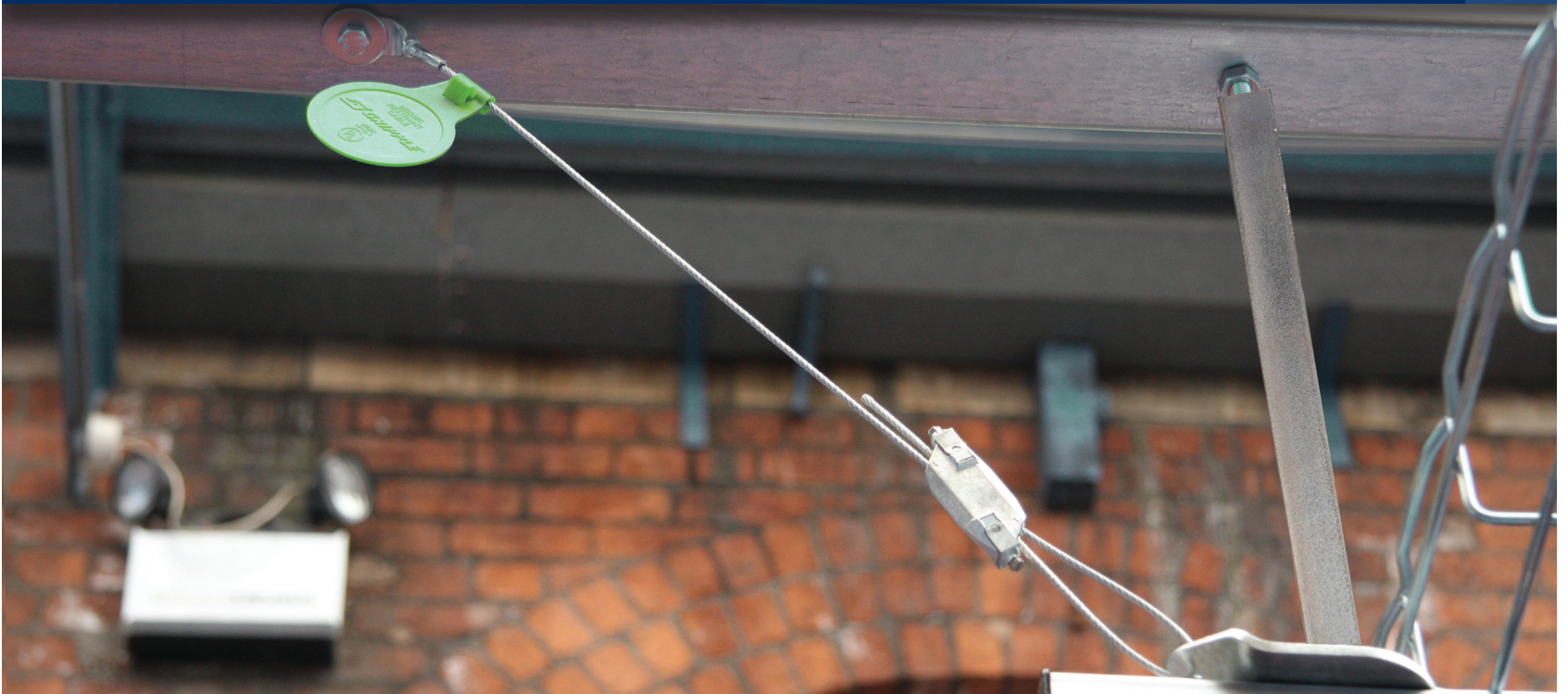




# *Seismic Solutions*

For Nonstructural Building Components



# APPROVALS & CERTIFICATIONS



Gripple Seismic is proud to hold the following industry approvals for our Cable Bracing Systems:

## OSHPD OPA 2123-10

Following extensive testing and qualifications, the California Office of Statewide Health Planning & Development (OSHPD) has assigned Gripple® Seismic Cable Bracing Systems GS10, GS12, and GS19 an OPA-2123-10 for Fixed Equipment Anchorage.

## UL NEBS GR 63 Core Certification

Underwriters Laboratories (UL) has awarded Gripple® Seismic Cable Bracing Systems the UL NEBS GR 63 Core Certification based on surpassing extensive shaker table testing requirements. Gripple® Seismic is the only seismic bracing company to hold this certification.

## SMACNA Verification

The Sheet Metal and Air Conditioning Contractors National Association (SMACNA) has verified that Gripple® Seismic Cable Bracing Systems are an acceptable alternative for seismic hanger bracing in strict accordance with the *ANSI / SMACNA Seismic Restraint Manual – Guidelines for Mechanical Systems*.

## Additional Qualifications

In addition, Gripple® Seismic Cable Bracing Systems have undergone all of the proper qualifications and extensive strength testing to meet any seismic design code requirements or standards, including:

- International Building Code (IBC)
- California State Building Code
- National Fire Protection Association (NFPA)
- American Society of Civil Engineers (ASCE) 7-05 Chapter 13
- Unified Facilities Criteria (UFC) 300 and 400
- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
- Federal Emergency Management Agency (FEMA)

VIMCO vibration and noise isolation products are manufactured in conformance with the guidelines of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 2011 Handbook – HVAC Applications Chapter 48, Table 47.





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# A SEISMIC INTRODUCTION



Gripple provides complete turn-key seismic solutions for your project's nonstructural equipment and components requiring seismic design or Anti-Terrorism / Force Protection (AT/FP). Our services include estimating, licensed engineering, cable bracing kits, vibration management products, and site reviews. Gripple provides evaluations and calculations in order to determine seismic solutions, and then provides you with the products to achieve those solutions.

Suspended nonstructural building components are critical for the proper functioning of a building, and make up a high percentage of a building's damage in a seismic event. Properly-engineered bracing and isolation of these services is particularly critical for essential facilities that must remain operational in the aftermath of an earthquake or seismic event (such as hospitals, fire/rescue, water/power, etc.), or facilities representing a substantial hazard to human life (such as schools, jails, etc.).

The types of MEP systems for which Gripple® Seismic can provide bracing & isolation solutions includes:



Part of Gripple® Seismic's services include providing the right products and services that meet the various seismic design requirements of your project, taking into consideration factors such as:

- Seismic Design Category / Occupancy Category
- Component Importance Factor
- Exemptions
- Requirements for Designated Seismic Systems
- Force / Displacement Equations
- Anchorage

Gripple® Seismic has been utilized on an extensive number of high-profile job sites that include research labs, healthcare facilities, manufacturing plants, government & military sites, educational institutions, corporate offices, data centers, and hotel/casinos.



*Bracing of electrical services*



*Bracing of busduct*



*Bracing of rectangular ductwork*



# ENGINEERING SERVICES

Ensuring that expected earthquake design performance objectives are met not only reduces the risk or damage to the nonstructural components itself, but also reduces the risk or damage to adjacent or closely located items from falling, overturning, swinging and impacting, leaking, etc. In addition, proper engineering reduces the life-safety risk to building occupants and, for critical facilities, provides the operability assurances necessary for Immediate Occupancy. "Critical facilities" would include hospitals, fire stations, police stations, and other such facilities.

The complex and technical nature of seismic bracing requirements, industry regulations, and life-safety issues necessitates a partner like Gripple, who can evaluate your project to determine its seismic and/or Anti-Terrorism / Force Protection (AT/FP) needs and requirements based on specific codes for the project and that particular geographic location. Gripple can offer you assurances with complete beginning-to-end seismic engineering services, such as:

## PE Stamped Drawings

- Engineered seismic bracing calculations and details based upon drawings/plans provided.
- PE stamped layout drawings for each service noting the proper location of Gripple® Seismic Cable Bracing and/or Vibration Management products (spring mounts, vibration isolation pads, hangers, and accessories), per the scope of the project.

## BIM Modeling and Clash Detection

- Provided as required by design scope. Includes 2D, 3D AutoCAD, and/or REVIT.

## Coordination and Site Reviews

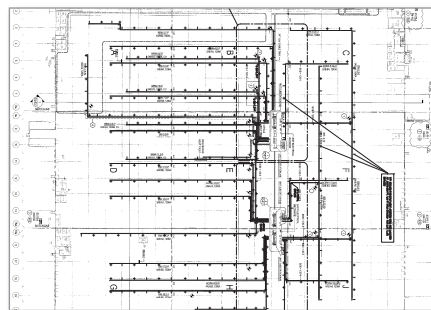
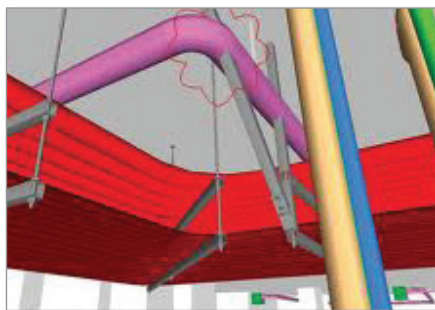
- With licensed Engineer and Gripple representative to ensure proper installation of seismic bracing / vibration isolation products.

## Budget Estimating

- Project quotes for engineering services and products are all-inclusive and will not increase after the pre-engineering evaluation.
- We work with you to provide a base number you can work into your budget, that does not change once the project quote has been agreed upon.

## Bracing & Isolation Products

- We'll provide you with the appropriate quantity of complete Gripple® Seismic Cable Brace Assembly kits and/or Vibration Isolation products, per Engineer's calculations for the required services.



# CABLE BRACING SYSTEMS



Gripple® Seismic Cable Bracing Systems are specifically designed and engineered to brace and secure suspended nonstructural equipment (VAV boxes, fans, unit heaters, small in-line pumps, etc.) and components (HVAC duct, conduit/cable tray, and piping) within a building or structure to minimize damage from an earthquake or seismic event.

Gripple® Seismic Bracing systems are ideal for use on nonstructural components and equipment requiring seismic design, such as in essential facilities that are required for emergency operations in the aftermath of an earthquake.

Gripple® Seismic Cable Bracing Systems offer the following advantages:

- Complete pre-engineered systems
- No field swaging of cables
- Up to 10 times faster to install
- No tools required
- Color coding allows easy field verification
- Suitable for new or retrofit installations
- Can be used in a variety of bracing configurations (transverse, longitudinal, 4-way)
- OSHPD OPA 2123-10 approval (GS10, GS12, and GS19 systems)
- SMACNA verified
- UL NEBS GR 63 Core Certification

Complete bracing kits include a length of cable with pre-attached end fitting and color-coded tag, Gripple® Seismic fastener, and standard or retrofit bracket. Four kit sizes are available:

Kit	Color	Design Strength (LRFD*)
GS10	Red	350 lbs
GS12	Green	1,050 lbs
GS19	Yellow	2,100 lbs
GS25	Purple	4,100 lbs

\* Load and Resistance Factor Design



*Transverse bracing*



*Longitudinal bracing*

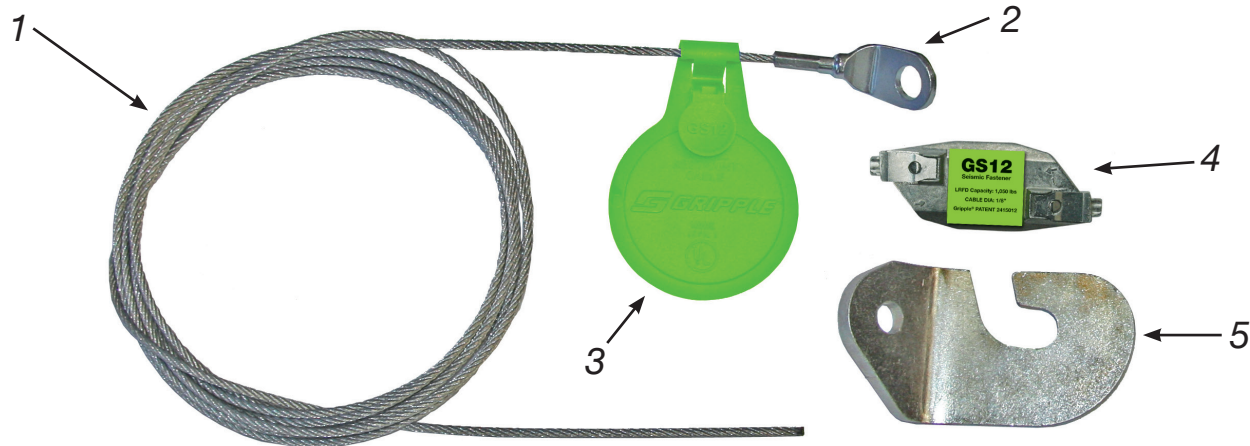


*4-Way bracing*



# CABLE BRACING COMPONENTS

There are four Gripple® Seismic cable bracing kit sizes available, each with its own Load and Resistance Factor Design (LRFD), selection of cable lengths, pre-attached end fittings, and bracket. As part of our Engineering services, Gripple will ensure that the bracing meets the seismic design requirements of the nonstructural components as related to weight loads and types of connections. Complete Cable Bracing Kits include the following components:



## 1- Gripple® Seismic Cable

Break strength certified, pre-stretched Gripple® Seismic cable. Available in lengths of 10ft, 15ft, and 20ft.

## 2- End Fitting



*E = 45° Eyelet*



*S = Standard Bracket\*  
\* w/ zinc plated copper ferrules*



*DS = Standard Double Bracket  
\* w/ zinc plated copper ferrules*

## 3- Color Coded Tag

Pre-assembled color coded tag attached to cable for easy field verification of cable diameter.  
GS10 = Red, GS12 = Green, GS19 = Yellow, GS25 = Purple

## 4- Gripple® Seismic Fastener



GS10



GS12



GS19



GS25

## 5- Loose Bracket

Standard or Retrofit Bracket in Single or Double Bracket configurations.



*Standard Bracket*

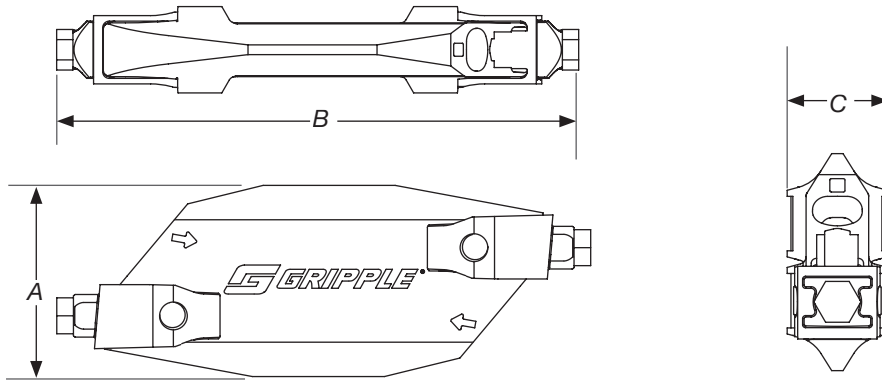


*Retrofit Bracket*

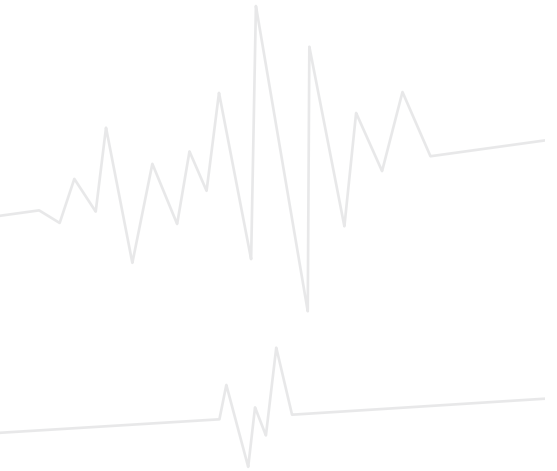
# COMPONENT DIMENSIONS



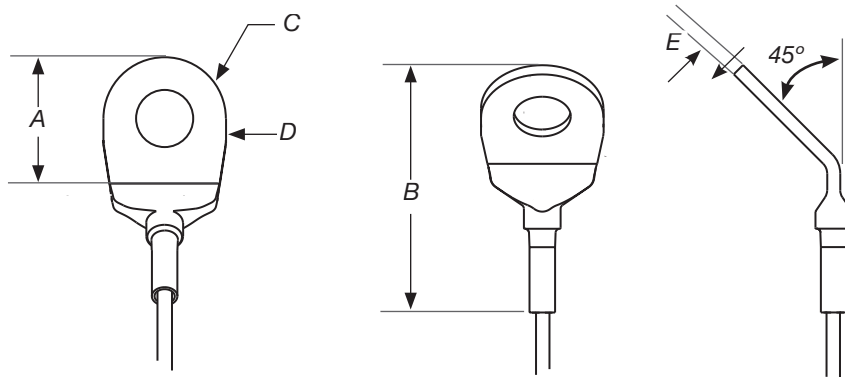
## Gripple® Seismic Fastener



Brace Size	Dimensions			Cable Construction
	A	B	C	
GS10 (5/64" cable)	1 9/64"	2 15/16"	33/64"	7 x 7
GS12 (1/8" cable)	1 9/64"	3 1/4"	35/64"	7 x 7
GS19 (3/16" cable)	1 11/32"	3 3/4"	9/16"	7 x 19
GS25 (1/4" cable)	1 23/32"	4 21/32"	11/16"	7 x 19



## Eyelet End Fitting

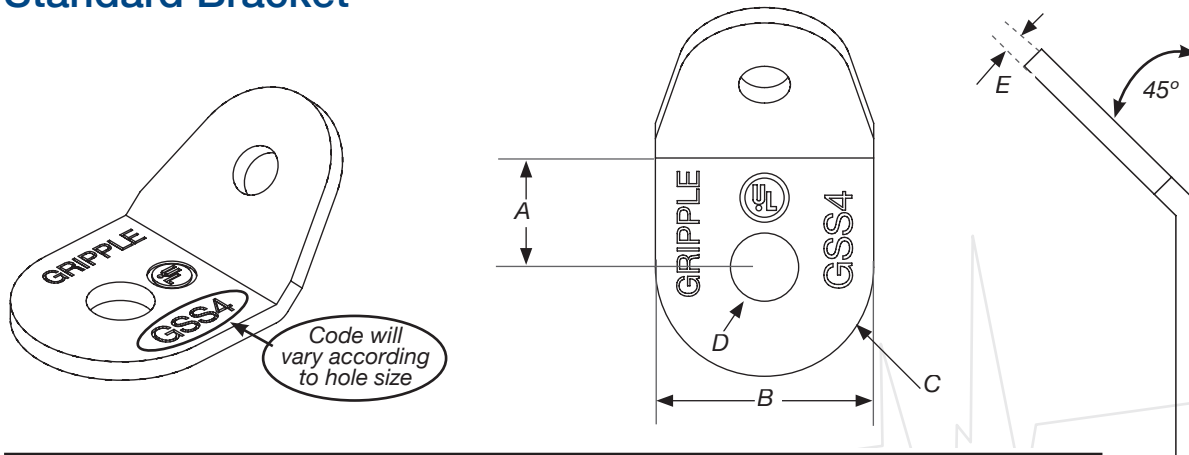


Eyelet Size	Dimensions				
	A	B	C ø	D ø	E
GSE4	1"	1 29/32"	53/64"	7/16"	1/8"



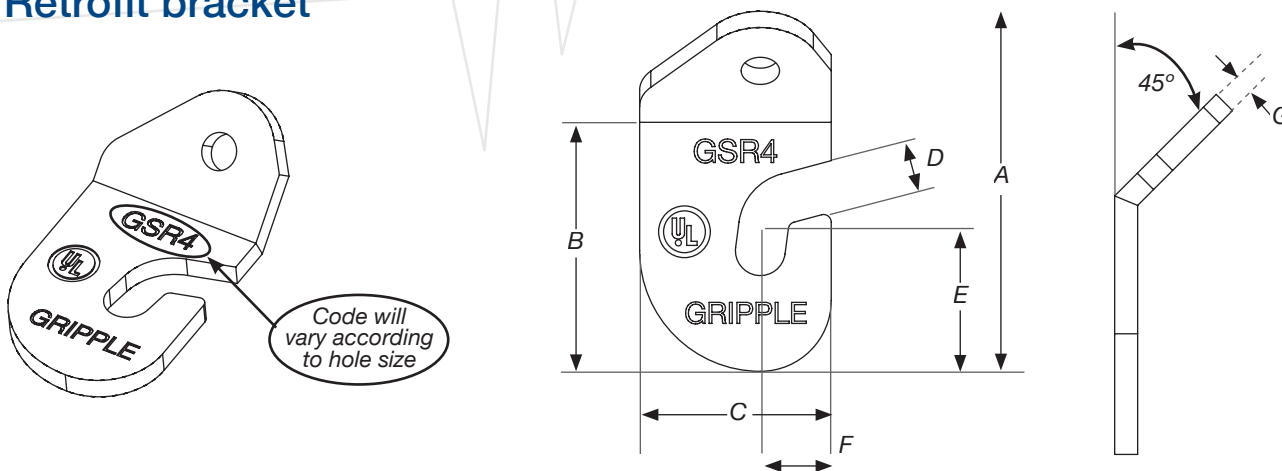
# COMPONENT DIMENSIONS

## Standard Bracket



Standard Bracket Size	Dimensions				
	A	B	C $\phi$	D $\phi$	E
GSS4	25/32"	1 9/16"	1 9/16"	7/16"	5/32"
GSS5	13/16"	1 9/16"	1 21/32"	9/16"	5/32"
GSS6	13/16"	1 9/16"	1 21/32"	11/16"	5/32"
GSS8	1"	1 31/32"	1 31/32"	13/16"	5/32"
GSS10	1 1/16"	1 31/32"	1 31/32"	1 5/64"	5/32"

## Retrofit bracket



Retrofit Bracket Size	Dimensions						
	A	B	C	D	E	F	G
GSR4	3 45/64"	2 9/16"	1 31/32"	7/16"	1 1/16"	45/64"	1/4"
GSR5	3 3/4"	4 5/8"	1 31/32"	9/16"	1 5/16"	45/64"	1/4"
GSR6	3 3/4"	4 5/8"	1 31/32"	11/16"	1 5/16"	45/64"	1/4"
GSR8	4 9/64"	3 1/16"	2 1/4"	13/16"	1 13/32"	55/64"	1/4"
GSR10	9 7/16"	3 5/16"	2 7/16"	1 1/16"	1 17/32"	29/32"	1/4"

# CABLE BRACING KIT CODES



Gripple Seismic Kit Size	Length	Seismic Bracket	Rod/ Structural Attachment Size	Product Code
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<b>GS10</b>	10ft	Standard	3/8"	GS10-10E4-S4
			1/2"	GS10-10S5-S5
	Retrofit	3/8"	GS10-10E4-R4	
		1/2"	GS10-10S5-R5	
	15ft	Standard	3/8"	GS10-15E4-S4
			1/2"	GS10-15S5-S5
Retrofit	3/8"	GS10-15E4-R4		
	1/2"	GS10-15S5-R5		
20ft	Standard	3/8"	GS10-20E4-S4	
		1/2"	GS10-20S5-S5	
Retrofit	3/8"	GS10-20E4-R4		
	1/2"	GS10-20S5-R5		

<b>GS12</b>	10ft	Standard	3/8"	GS12-10E4-S4
			1/2"	GS12-10S5-S5
	Retrofit	3/8"	GS12-10E4-R4	
		1/2"	GS12-10S5-R5	
	15ft	Standard	3/8"	GS12-15E4-S4
			1/2"	GS12-15S5-S5
Retrofit	3/8"	GS12-15E4-R4		
	1/2"	GS12-15S5-R5		
20ft	Standard	3/8"	GS12-20E4-S4	
		1/2"	GS12-20S5-S5	
Retrofit	3/8"	GS12-20E4-R4		
	1/2"	GS12-20S5-R5		

<b>GS19</b>	10ft	Standard	3/8"	GS19-10S4-S4
			1/2"	GS19-10S5-S5
			5/8"	GS19-10S6-S6
		Retrofit	3/4"	GS19-10S8-S8
			3/8"	GS19-10S4-R4
			1/2"	GS19-10S5-R5
	15ft	Standard	5/8"	GS19-10S6-R6
			3/4"	GS19-10S8-R8
			3/8"	GS19-15S4-S4
		Retrofit	1/2"	GS19-15S5-S5
			5/8"	GS19-15S6-S6
			3/4"	GS19-15S8-S8
	20ft	Standard	3/8"	GS19-15S4-R4
			1/2"	GS19-15S5-R5
			5/8"	GS19-15S6-R6
		Retrofit	3/4"	GS19-15S8-R8
			3/8"	GS19-20S4-S4
			1/2"	GS19-20S5-S5
20ft	Standard	5/8"	GS19-20S6-S6	
		3/4"	GS19-20S8-S8	
		3/8"	GS19-20S4-R4	
	Retrofit	1/2"	GS19-20S5-R5	
		5/8"	GS19-20S6-R6	
		3/4"	GS19-20S8-R8	

Gripple Seismic Kit Size	Length	Seismic Bracket	Rod/ Structural Attachment Size	Product Code
--------------------------	--------	-----------------	---------------------------------	--------------

<b>GS25</b>	10ft	Standard	5/8"	GS25-10DS6-DS6
			3/4"	GS25-10DS8-DS8
		Retrofit	1/2"	GS25-10DS10-DS10
			5/8"	GS25-10DS6-DR6
	15ft	Standard	3/4"	GS25-10DS8-DR8
			1/2"	GS25-10DS10-DR10
		Retrofit	5/8"	GS25-15DS6-DS6
			3/4"	GS25-15DS8-DS8
	20ft	Standard	1/2"	GS25-15DS10-DS10
			5/8"	GS25-15DS6-DR6
		Retrofit	3/4"	GS25-15DS8-DR8
			1/2"	GS25-15DS10-DR10
20ft	Standard	5/8"	GS25-20DS6-DS6	
		3/4"	GS25-20DS8-DS8	
	Retrofit	1/2"	GS25-20DS10-DS10	
		5/8"	GS25-20DS6-DR6	
Retrofit	3/4"	GS25-20DS8-DR8		
	1/2"	GS25-20DS10-DR10		

**Cable Size**  
 GS10 = 5/64"  
 GS12 = 1/8"  
 GS19 = 3/16"  
 GS25 = 1/4"

**Cable Length**  
 10, 15 or 20ft

**End Fitting**  
 E = 45° Eyelet  
 S = Standard Single Bracket  
 DS = Standard Double Bracket

**GS12-10E4-S4**

**End Fitting Size**  
 4 = 3/8"  
 5 = 1/2"  
 6 = 5/8"  
 8 = 3/4"  
 10 = 1"

**Style of Loose Bracket**  
 S = Standard Bracket  
 R = Retrofit Bracket  
 DS = Double Standard Bracket  
 DR = Double Retrofit Bracket  
 (Double Brackets for GS25 only)

**Loose Bracket Size**  
 4 = 3/8"  
 5 = 1/2"  
 6 = 5/8"  
 8 = 3/4"  
 10 = 1"

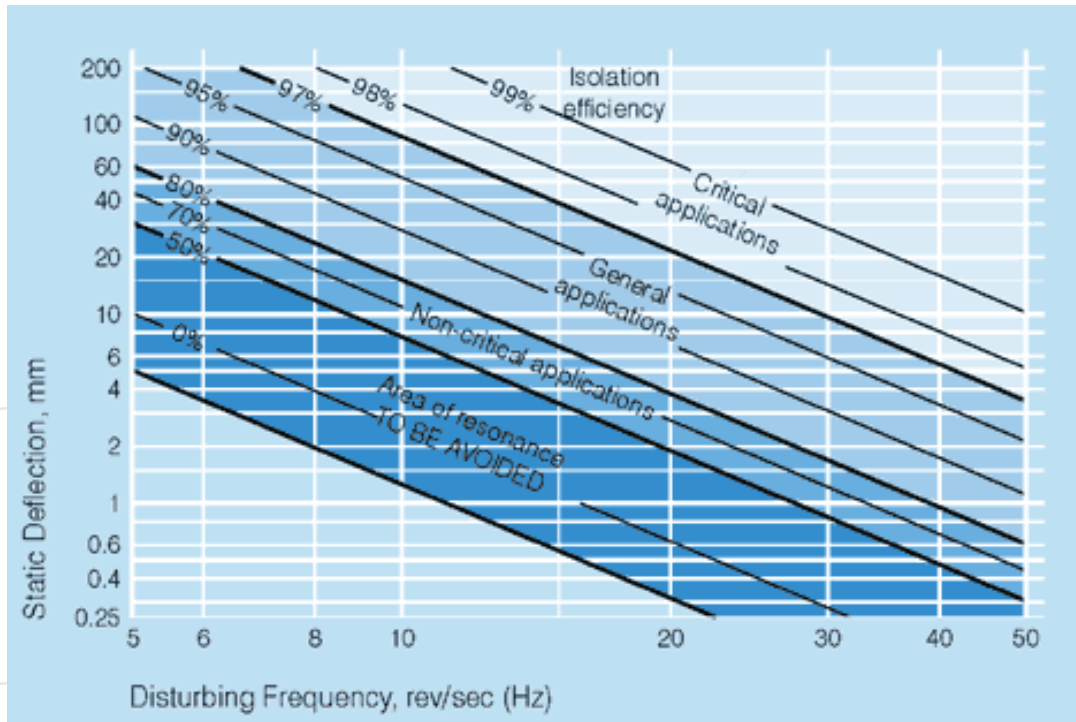
Gripple Seismic installation manuals should be consulted when designing or installing Gripple Seismic bracing kits.



# VIBRATION MANAGEMENT

A full selection of vibration and noise isolation products are available in North America through your Gripple Inc. Territory Manager or representative. These products are manufactured for Gripple Inc. by Vibration Management Corporation (VIMCO). As part of Gripple's Engineering responsibility, we ensure that these vibration management products are properly designed, taking into consideration guidelines for correct mounting and anchor position.

The Isolation Efficiency chart below illustrates the theoretical relationship between Isolation Efficiency, Disturbing Frequency, and isolator Static Deflection:



Disturbing Frequency = *the frequency of vibration produced by an unbalanced, rotating, or reciprocating movement in mass.*

Natural Frequency = *the number of complete cycles of oscillation a mass will vibrate in a given unit of time if a force displaces it from its equilibrium position and allows it to vibrate freely.*

Static Deflection = *the distance an isolator will deflect under the static or dead weight of the equipment.*

Isolation Efficiency = *the percentage reduction in the amplitude of the transmitted mechanical vibration.*

## Isolator 5-Star Rating System

Vibration Isolation Efficiency is directly related to the amount of deflection (compression) of the isolating element. Our range of vibration isolators have all been classified into one of five categories, based on their Isolation Efficiency as detailed below. Their Star Rating can be found with each selection table on the following pages.

Star Rating	Isolator Deflection	Isolator Efficiency	Performance Classification
★	up to 0.20"	92%	Basic
★ ★	from 0.21" to 0.50"	96%	Moderate
★ ★ ★	from 0.51" to 1.50"	98%	Good
★ ★ ★ ★	from 1.51" to 2.50"	99%	Very Good
★ ★ ★ ★ ★	more than 2.50"	99.5%	Excellent

\* Isolator efficiencies are nominal based on equipment disturbing frequency of 1,800 rpm

# SPRING MOUNTS - HOUSED



- For floor mounted systems
- Powder coated cast iron housings (70-110 micron ASTM D4138-07a)
- Internal elastomeric snubbers prevent metal to metal contact
- Anti-skid elastomeric acoustical pad; Built-in levelling device
- Spring elements color-coded for easy field verification
- Mounting should be adjusted so upper housing clears lower housing by at least 1/4", but not more than 1/2"
- External Height Adjustment models and Internal Height Adjustment model options available
- Consult spring chart on page 33 for isolator performance data

## Housed Spring Mounts - 1" Deflection Series ★★★

Model *	Load Range (lbs)	Free Height (H) **
Zx-121	1-50	4"
Zx-122	51-80	
Zx-123	81-130	
Zx-124	131-210	
Zx-125	211-300	
Zx-126	301-370	
Zx-127	371-700	
Ax-1-109	701-750	5 1/2"
Ax-1-110	751-910	
Ax-1-111	911-1,080	
Ax-1-112	1,081-1,250	
Ax-1-109-113	1,251-1,330	
Ax-1-110-113	1,331-1,380	
Ax-1-111-113	1,381-1,550	
Ax-1-112-113	1,551-1,832	
Ax-2-111	1,833-2,160	5 3/4"
Ax-2-112	2,161-2,500	
Ax-2-109-113	2,501-2,660	
Ax-2-110-113	2,661-2,760	
Ax-2-111-113	2,761-3,100	
Ax-2-112-113	3,101-3,665	
Ax-4-111	3,666-4,330	6"
Ax-4-112	4,331-5,000	
Ax-4-109-113	5,001-5,330	
Ax-4-110-113	5,331-5,530	
Ax-4-111-113	5,531-6,200	
Ax-4-112-113	6,201-7,330	

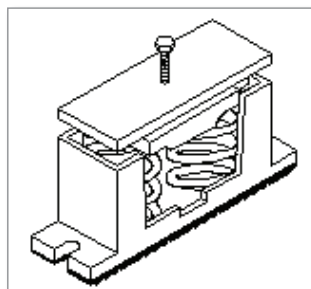
## Housed Spring Mounts - 2" Deflection Series ★★★★★

Model *	Load Range (lbs)	Free Height (H) **
Ax-1-140	1-80	6 1/2"
Ax-1-141	81-160	
Ax-1-142	161-310	
Ax-1-143	311-410	
Ax-1-144	411-595	
Ax-1-141-146B	596-667	
Ax-1-147	668-1,190	
Ax-1-148A	1,191-1,576	
Ax-1-147-146B	1,577-1,690	
Ax-1-148A-146B	1,691-2,076	
Ax-2-147	2,077-2,380	6 3/4"
Ax-2-148A	2,381-3,152	
Ax-2-147-146B	3,153-3,380	
Ax-2-148A-146B	3,381-4,152	7"
Ax-4-147	4,153-4,760	
Ax-4-148A	4,761-6,305	
Ax-4-147-146B	6,306-6,760	
Ax-4-148A-146B	6,761-8,305	

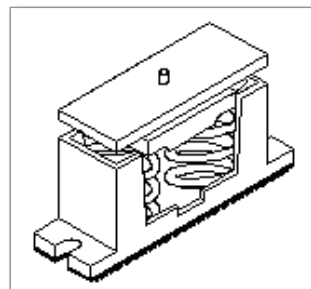
\* Insert mounting style selection in place of the 'x' in the model number:

- 'A' = External Adjustment
- 'B' = Pin Top
- 'C' = Flat Top
- 'D' = Neoprene Pad Top

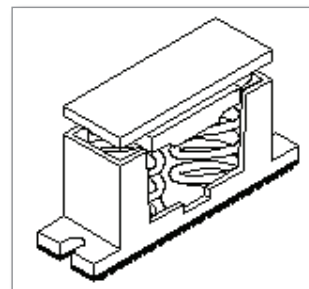
★ Refer to page 11 for Isolator 5-Star Rating System



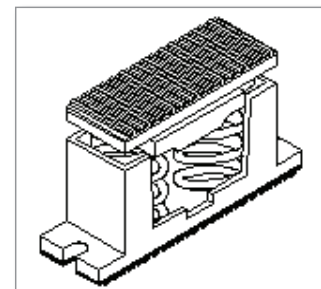
External Height Adjustment



Internal Height Adj. - Pin Top



Internal Height Adj. - Flat Top



Internal Height Adj. - Pad Top



# SPRING MOUNTS - HOUSED

## ZA / ZB / ZC / ZD Models

2 1/4" 3/8"  
4 1/4"  
5 1/8" C.C. Distance  
5 5/8"

\*\* Free Height (H) indicated in table is for ZA isolator.

For Free Height of ZB / ZC models, add 1/4".

For Free Height of ZD model, add 1/2".

3/8" Dia. Height Adjustment Bolt

Free Height

1/2"

Anti-skid elastomeric acoustical pad

Model ZA - External adjustment

Model ZB - Internal adjustment, Pin Top

Model ZC - Internal adjustment, Flat Top

Model ZD - Internal adjustment, Pad Top

## AA-1 / AB-1 / AC-1 / AD-1 Models

2 7/8" 5/8"  
4 7/8"  
6 1/2" C.C. Distance  
7 1/2"

\*\* Free Height (H) indicated in table is for AA-1 isolator.

For Free Height of AB-1 / AC-1 models, add 3/8".

For Free Height of AD-1 model, add 5/8".

1/2" Dia. Height Adjustment Bolt

Free Height

11/16"

Anti-skid elastomeric acoustical pad

Model AA-1 - External adjustment

Model AB-1 - Internal adjustment, Pin Top

Model AC-1 - Internal adjustment, Flat Top

Model AD-1 - Internal adjustment, Pad Top

## AA-2 / AB-2 / AC-2 / AD-2 Models

2 7/8" 5/8"  
7 3/4"  
9 1/4" C.C. Distance  
10 1/4"

\*\* Free Height (H) indicated in table is for AA-2 isolator.

For Free Height of AB-2 / AC-2 models, add 1/2".

For Free Height of AD-2 model, add 3/4".

5/8" Dia. Height Adjustment Bolt

Free Height

11/16"

Anti-skid elastomeric acoustical pad

Model AA-2 - External adjustment

Model AB-2 - Internal adjustment, Pin Top

Model AC-2 - Internal adjustment, Flat Top

Model AD-2 - Internal adjustment, Pad Top

## AA-4 / AB-4 / AC-4 / AD-4 Models

5" 5/8"  
7 1/2"  
9 1/4" C.C. Distance  
10 1/4"

\*\* Free Height (H) indicated in table is for AA-4 isolator.

For Free Height of AB-4 / AC-4 models, add 1/2".

For Free Height of AD-4 model, add 3/4".

5/8" Dia. Height Adjustment Bolt

Free Height

11/16"

Anti-skid elastomeric acoustical pad

Model AA-4 - External adjustment

Model AB-4 - Internal adjustment, Pin Top

Model AC-4 - Internal adjustment, Flat Top

Model AD-4 - Internal adjustment, Pad Top

# SPRING MOUNTS - FREE STANDING



## Weld-Free Construction

- For floor mounted systems
- Large diameter laterally stable springs; Built-in levelling device
- Anti-skid elastomeric acoustical cup
- Spring elements color-coded for easy field verification
- Weld-Free (rubber cup) construction
- Consult spring chart on page 33 for isolator performance data

### Weld-Free Construction - 1" Deflection Series



Model	Load Range (lbs)	Free Height (H)
BN-041 / BO-041 / BP-041	1-23	3 1/4" (BN / BO models)
BN-042 / BO-042 / BP-042	24-40	
BN-043 / BO-043 / BP-043	41-65	
BN-044 / BO-044 / BP-044	66-90	
BN-045 / BO-045 / BP-045	91-185	2 3/4" (BP models)
BA-124 / BD-124 / BG-124	186-210	4 1/2" (BA / BD models)
BA-125 / BD-125 / BG-125	211-300	
BA-126 / BD-126 / BG-126	301-370	3 3/4" (BG models)
BA-127 / BD-127 / BG-127	371-700	
BB-156 / BE-156 / BH-156	701-750	5 1/2" (BB / BE models)
BB-157 / BE-157 / BH-157	751-910	
BB-158 / BE-158 / BH-158	911-1,500	4 3/4" (BH models)
BB-159 / BE-159 / BH-159	1,501-2,082	
BB-159-161 / BE-159-161 / BH 159-161	2,083-2,603	

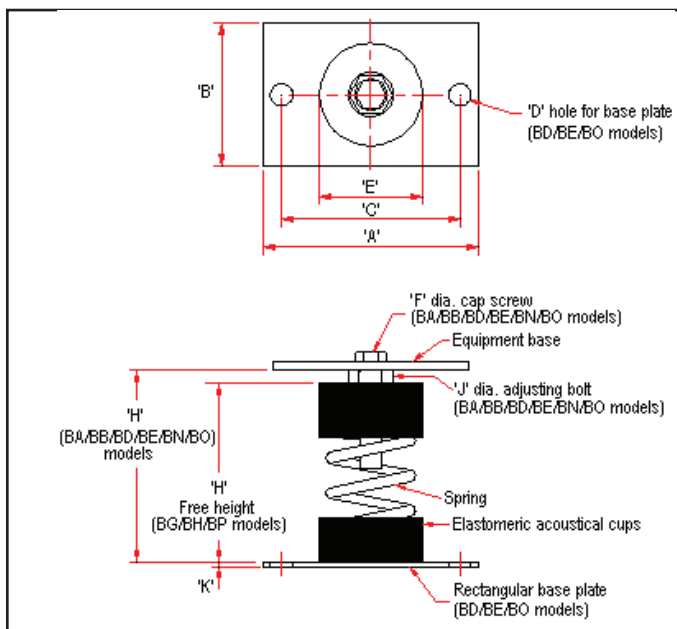
### Weld-Free Construction - 3" Deflection Series



Model	Load Range (lbs)	Free Height (H)
BB-181 / BE-181 / BH-181	1-100	7 7/8" (BB / BE models)
BB-182 / BE-182 / BH-182	101-150	
BB-183 / BE-183 / BH-183	151-210	
BB-184 / BE-184 / BH-184	211-332	
BB-185 / BE-185 / BH-185	333-580	
BB-186 / BE-186 / BH-186	581-850	7 1/8" (BH models)
BB-187 / BE-187 / BH-187	851-1,157	
BB-186-199 / BE-186-199 / BH-186-199	1,158-1,470	
BB-187-199 / BE-187-199 / BH-187-199	1,471-1,825	

★ Refer to page 11 for Isolator 5-Star Rating System

### BA / BB / BD / BE / BG / BH / BN / BO / BP Models



Mount Series	Dimensions							
	A	B	C	D	E	F	J	K
BA	--	--	--	--	2 3/8"	3/8"	5/8"	--
BB	--	--	--	--	2 7/8"	3/8"	5/8"	--
BD	6"	4"	5"	5/8"	2 3/8"	3/8"	5/8"	1/8"
BE	6"	4"	5"	5/8"	2 7/8"	3/8"	5/8"	1/8"
BG	--	--	--	--	2 3/8"	--	--	--
BH	--	--	--	--	2 7/8"	--	--	--
BN	--	--	--	--	1 1/2"	1/4"	3/8"	--
BO	4"	2"	3"	3/8"	1 1/2"	1/4"	3/8"	--
BP	--	--	--	--	1 1/2"	--	--	1/8"

**WELD-FREE CONSTRUCTION:**

- Models BN, BA, BB: w/o base plate
- Models BO, BD, BE: with base plate
- Models BP, BG, BH: w/o height adjustment or anchoring option

# SPRING MOUNTS - FREE STANDING

## Welded Construction

- For floor mounted systems
- Large diameter laterally stable springs; Built-in leveling device
- Anti-skid elastomeric acoustical pad
- Spring elements color-coded for easy field verification
- Mounting holes furnished as standard
- Welded steel construction and galvanized finish
- Consult spring chart on page 33 for isolator performance data

### Welded Construction - 1" Deflection Series ★★☆☆

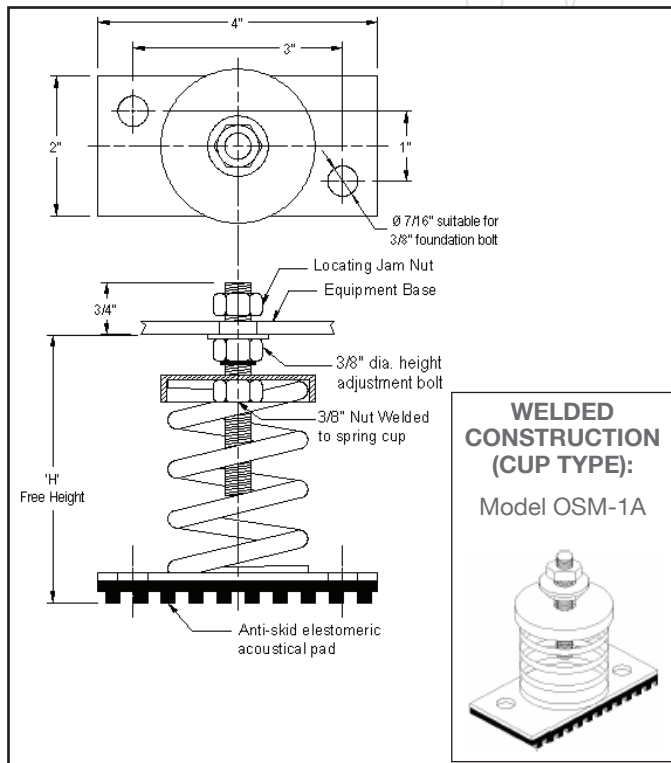
Model	Load Range (lbs)	Free Height (H)
OSM-1A-121	1-50	3 3/4"
OSM-1A-122	51-80	
OSM-1A-123	81-130	
OSM-1A-124	131-210	
OSM-1A-125	211-300	
OSM-1A-126	301-370	
OSM-1A-127	371-700	
OSM-1B-156	701-750	5 5/8"
OSM-1B-157	751-910	
OSM-1B-158	911-1,500	
OSM-1B-159	1,501-2,082	
OSM-1B-159-161	2,083-2,603	

### Welded Construction - 3" Deflection Series ★★★★★

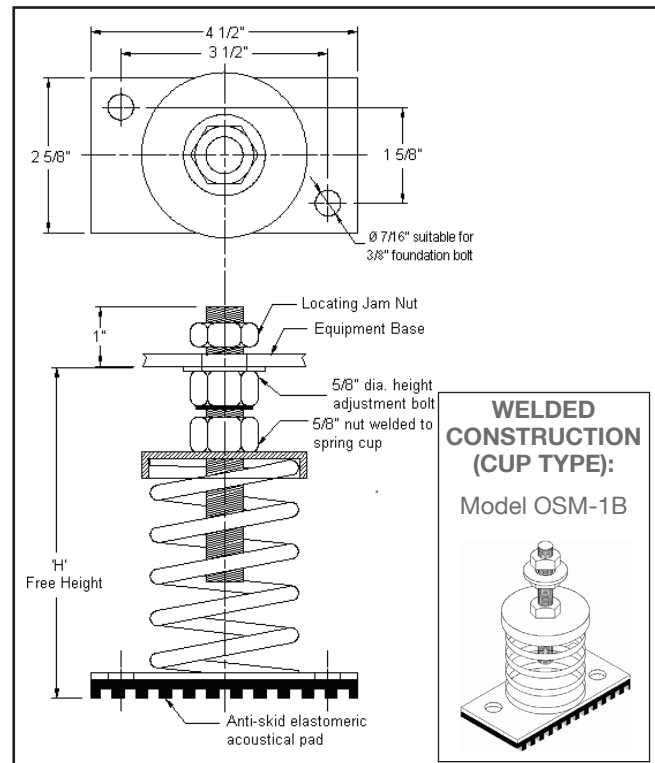
Model	Load Range (lbs)	Free Height (H)
OSM-1B-181	1-100	7 3/4"
OSM-1B-182	101-150	
OSM-1B-183	151-210	
OSM-1B-184	211-332	
OSM-1B-185	333-580	
OSM-1B-186	581-850	
OSM-1B-187	851-1,157	
OSM-1B-186-199	1,158-1,470	
OSM-1B-187-199	1,471-1,825	

★ Refer to page 11 for Isolator 5-Star Rating System

### OSM-1A Models



### OSM-1B Models



# SPRING MOUNTS - FREE STANDING



## Welded Construction *cont.*

- For floor mounted systems
- Large diameter laterally stable springs; Built-in levelling device
- Anti-skid elastomeric acoustical pad
- Spring elements color-coded for easy field verification
- Mounting holes furnished as standard
- Welded steel construction and galvanized finish
- Consult spring chart on page 33 for isolator performance data

### 1" Deflection Series ★★☆☆

Model	Load Range (lbs)	Free Height (H)
OSM-1-150	1-100	4 7/8"
OSM-1-151	101-180	
OSM-1-152	181-270	
OSM-1-153	271-370	
OSM-1-154	371-500	
OSM-1-155	501-600	
OSM-1-156	601-750	
OSM-1-157	751-910	
OSM-1-158	911-1,500	
OSM-1-159	1,501-2,082	
OSM-1-159-161	2,083-2,603	4 7/8"
OSM-2-158	2,604-3,000	
OSM-2-159	3,001-4,165	
OSM-2-159-161	4,166-5,207	5 1/8"
OSM-4-158	5,208-6,000	
OSM-4-159	6,001-8,330	
OSM-4-159-161	8,331-10,415	

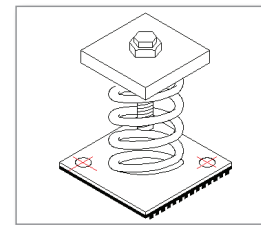
### 2" Deflection Series ★★☆☆

Model	Load Range (lbs)	Free Height (H)
OSM-1-140	1-80	6 1/4"
OSM-1-141	81-160	
OSM-1-142	161-310	
OSM-1-143	311-410	
OSM-1-144	411-595	
OSM-1-141-146B	596-647	
OSM-1-147	648-1,190	
OSM-1-148A	1,191-1,576	
OSM-1-147-146B	1,577-1,690	
OSM-1-148A-146B	1,691-2,076	
OSM-2-147	2,077-2,380	6 1/4"
OSM-2-148A	2,381-3,152	
OSM-2-147-146B	3,153-3,380	
OSM-2-148A-146B	3,381-4,152	6 1/2"
OSM-4-147	4,153-4,760	
OSM-4-148A	4,761-6,305	
OSM-4-147-146B	6,306-6,760	
OSM-4-148A-146B	6,761-8,305	

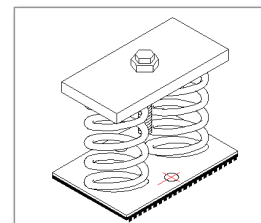
### 3" Deflection Series ★★☆☆

Model	Load Range (lbs)	Free Height (H)
OSM-1-181	1-100	7 1/4"
OSM-1-182	101-150	
OSM-1-183	151-210	
OSM-1-184	211-332	
OSM-1-185	333-580	
OSM-1-186	581-850	
OSM-1-187	851-1,157	
OSM-1-186-199	1,158-1,470	7 1/4"
OSM-1-187-199	1,471-1,825	
OSM-2-187	1,826-2,316	
OSM-2-186-199	2,317-2,950	7 1/2"
OSM-2-187-199	2,951-3,650	
OSM-4-187	3,651-4,632	
OSM-4-186-199	4,633-5,910	
OSM-4-187-199	5,911-7,300	

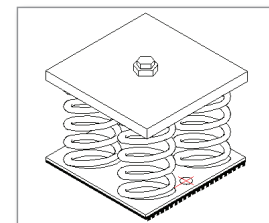
★ Refer to page 11 for Isolator 5-Star Rating System



Model OSM-1



Model OSM-2



Model OSM-4

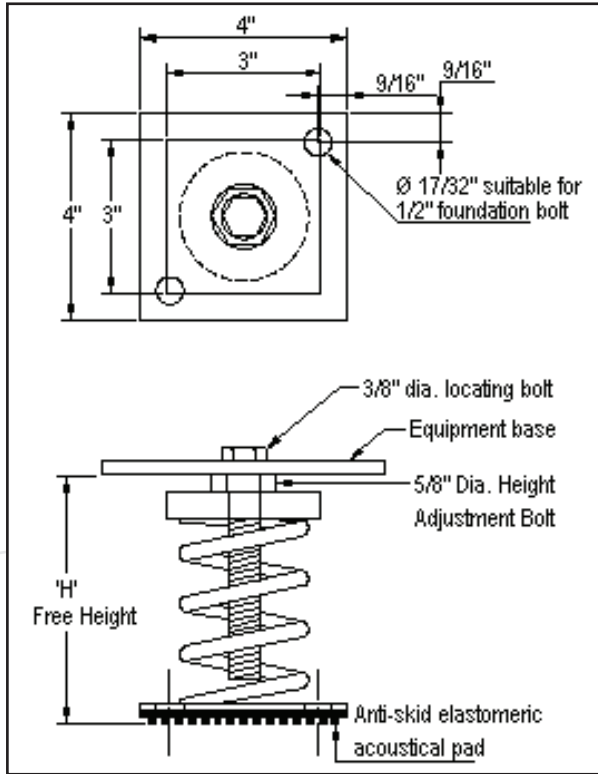




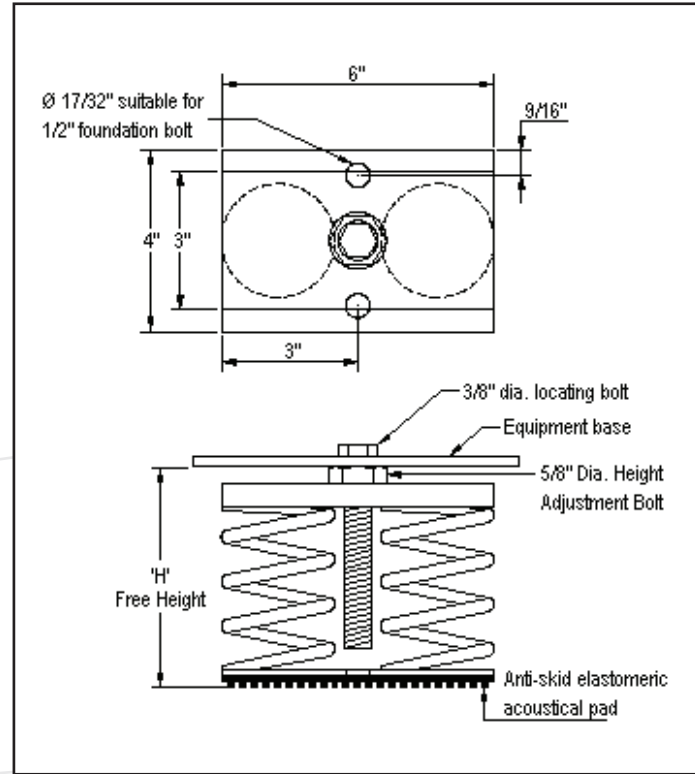
# SPRING MOUNTS - FREE STANDING

## Welded Construction *cont.*

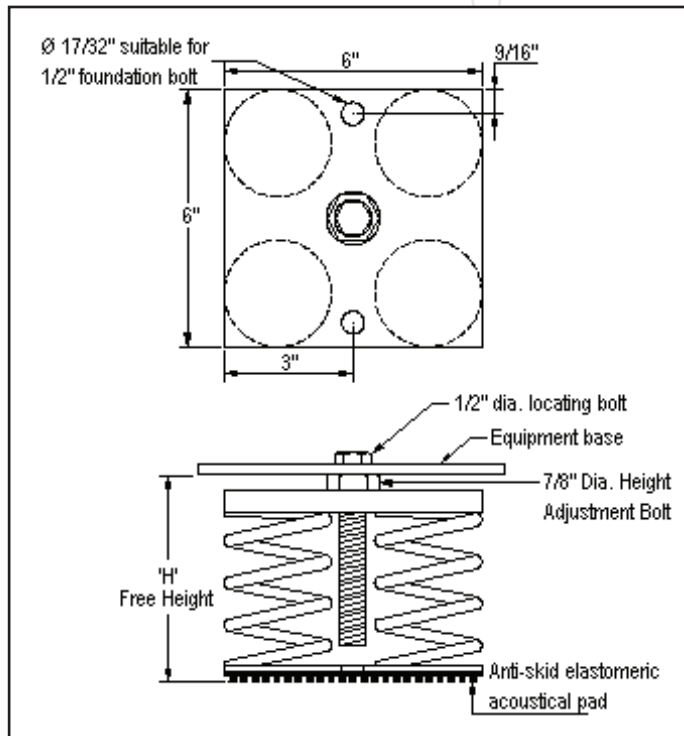
### OSM-1 Models



### OSM-2 Models



### OSM-4 Models



# SPRING MOUNTS - VERTICAL RESTRAINT



- For floor mounted systems requiring vertical restraint due to reduced equipment loads or large external forces (i.e. wind)
- Built-in levelling device
- Spring elements color-coded for easy field verification
- Welded steel construction and galvanized finish
- Mounting holes furnished as standard; Elastomeric 'non short circuiting' grommets
- Consult spring chart on page 33 for isolator performance data

## 1" Deflection Series ★★ ★

Model	Load Range (lbs)	Free Height (H)
RSM-1-150	1-100	5 7/8"
RSM-1-151	101-180	
RSM-1-152	181-270	
RSM-1-153	271-370	
RSM-1-154	371-500	
RSM-1-155	501-600	
RSM-1-156	601-750	
RSM-1-157	751-910	
RSM-1-158	911-1,500	
RSM-1-159	1,501-2,082	
RSM-1-159-161	2,083-2,603	6"
RSM-2-158	2,604-3,000	
RSM-2-159	3,001-4,165	
RSM-2-159-161	4,166-5,207	6 1/2"
RSM-4-158	5,208-6,000	
RSM-4-159	6,001-8,330	
RSM-4-159-161	8,331-10,415	

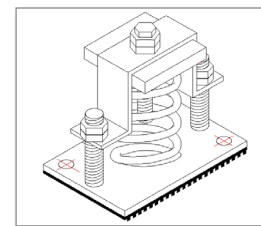
## 2" Deflection Series ★★ ★★ ★

Model	Load Range (lbs)	Free Height (H)
RSM-1-140	1-80	7 1/4"
RSM-1-141	81-160	
RSM-1-142	161-310	
RSM-1-143	311-410	
RSM-1-144	411-595	
RSM-1-141-146B	596-647	
RSM-1-147	648-1,190	
RSM-1-148A	1,191-1,576	
RSM-1-147-146B	1,577-1,690	
RSM-1-148A-146B	1,691-2,076	
RSM-2-147	2,077-2,380	7 3/8"
RSM-2-148A	2,381-3,152	
RSM-2-147-146B	3,153-3,380	
RSM-2-148A-146B	3,381-4,152	7 7/8"
RSM-4-147	4,153-4,760	
RSM-4-148A	4,761-6,305	
RSM-4-147-146B	6,306-6,760	
RSM-4-148A-146B	6,761-8,305	

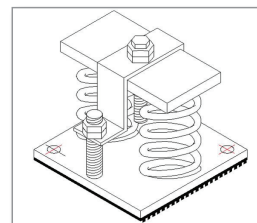
## 3" Deflection Series ★★ ★★ ★★ ★

Model	Load Range (lbs)	Free Height (H)
RSM-1-181	1-100	8 1/4"
RSM-1-182	101-150	
RSM-1-183	151-210	
RSM-1-184	211-332	
RSM-1-185	333-580	
RSM-1-186	581-850	
RSM-1-187	851-1,157	
RSM-1-186-199	1,158-1,470	
RSM-1-187-199	1,471-1,825	
RSM-2-187	1,826-2,316	
RSM-2-186-199	2,317-2,950	
RSM-2-187-199	2,951-3,650	
RSM-4-187	3,651-4,632	8 7/8"
RSM-4-186-199	4,633-5,910	
RSM-4-187-199	5,911-7,300	

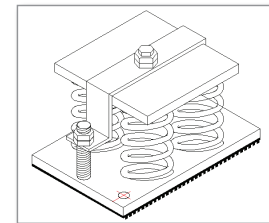
★ Refer to page 11 for Isolator 5-Star Rating System



Model RSM-1



Model RSM-2

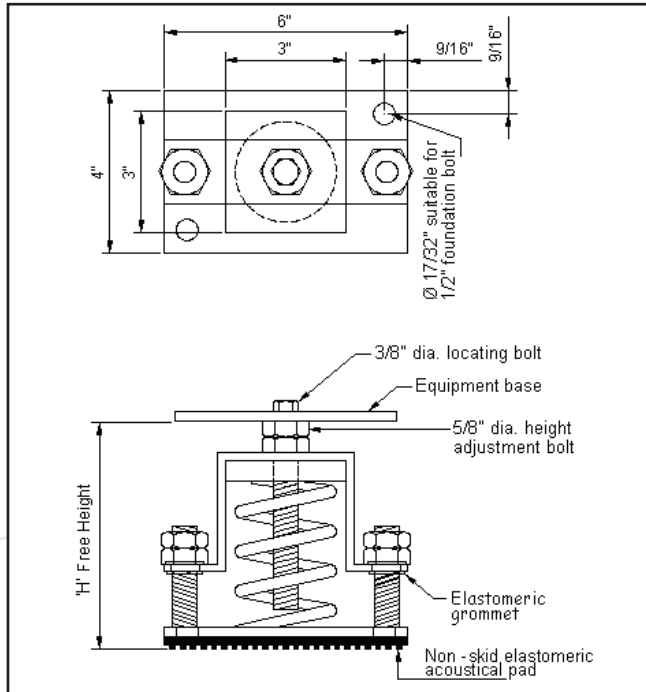


Model RSM-4

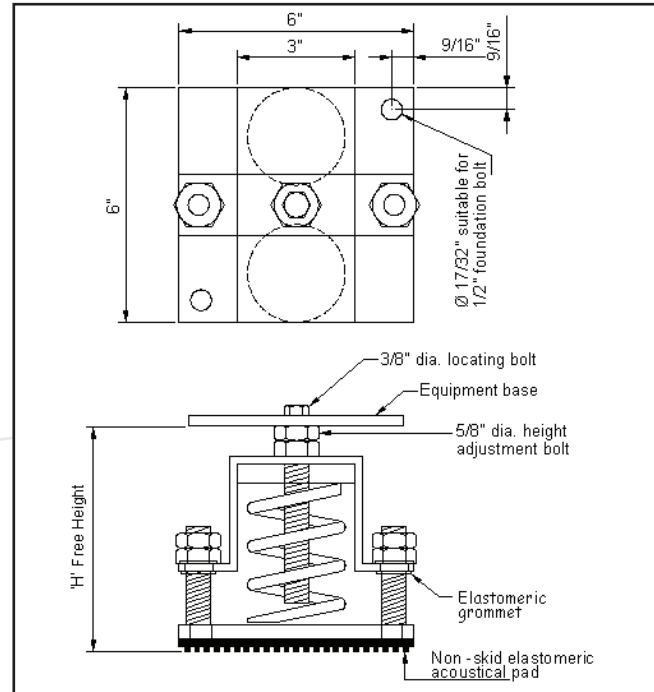


# SPRING MOUNTS - VERTICAL RESTRAINT

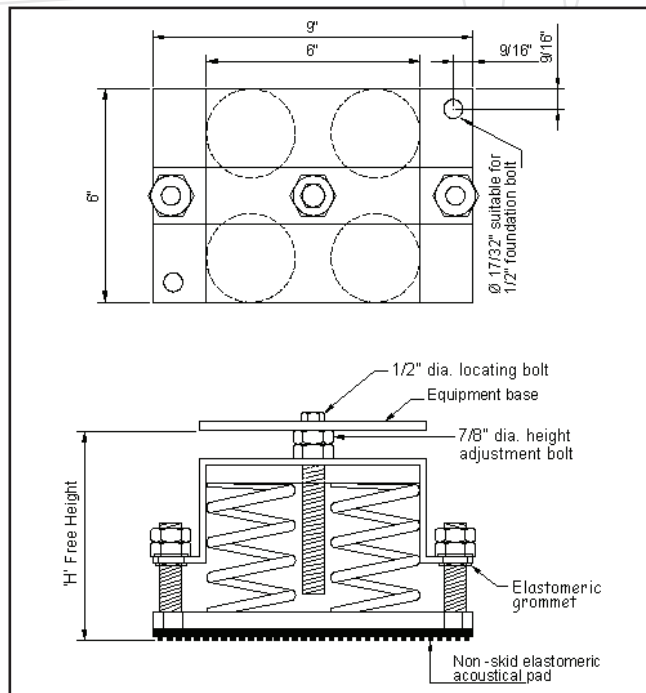
## RSM-1 Models



## RSM-2 Models



## RSM-4 Models



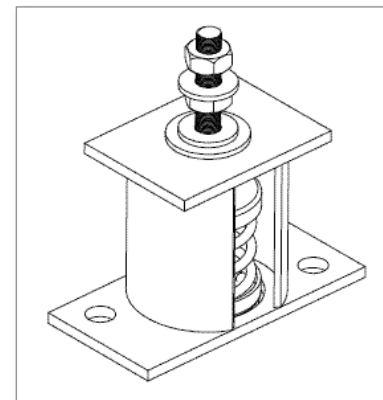
# SPRING MOUNTS - ALL-DIRECTIONAL RESTRAINT



- For floor mounted systems
- Suitable for most seismic zone IV applications; all isolators certified to withstand minimum 1.39 G-force
- SSMA-1 + SSMB-1 models: powder coated housing (50-70 micron ASTM D4138-07a); SSM-1 models: zinc metallized housing
- Large diameter laterally stable springs; Built-in levelling device
- Spring elements color-coded for easy field verification
- Welded steel construction; mounting holes furnished as standard
- Consult spring chart on page 33 for isolator performance data

## 1" Deflection Series ★★☆☆

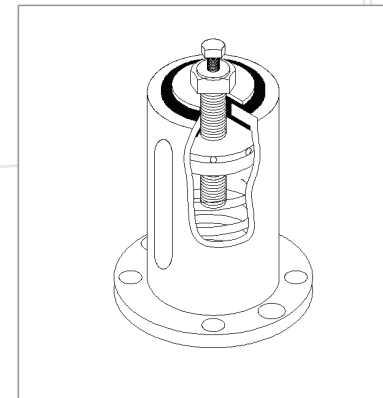
Model	Load Range (lbs)	'G' Rating
SSMA-1-121	1-50	32.50
SSMA-1-122	51-80	19.69
SSMA-1-123	81-130	11.81
SSMA-1-124	131-210	7.51
SSMA-1-125	211-300	5.28
SSMA-1-126	301-370	4.33
SSMA-1-127	371-700	2.32
SSMB-1-156 / SSM-1-156	701-750	4.82 / 6.74
SSMB-1-157 / SSM-1-157	751-910	3.95 / 5.52
SSMB-1-158 / SSM-1-158	911-1,500	2.41 / 3.37
SSMB-1-159 / SSM-1-159	1,501-2,082	1.73 / 2.42
SSMB-1-159-161 / SSM-1-159-161	2,083-2,603	1.39 / 1.94



Models SSMA-1 and SSMB-1

## 2" Deflection Series ★★☆☆

Model	Load Range (lbs)	'G' Rating
SSMB-1-140 / SSM-1-140	1-80	43.87 / 61.31
SSMB-1-141 / SSM-1-141	81-160	21.77 / 30.42
SSMB-1-142 / SSM-1-142	161-310	11.58 / 16.18
SSMB-1-143 / SSM-1-143	311-410	8.69 / 12.15
SSMB-1-144 / SSM-1-144	411-595	6.08 / 8.50
SSMB-1-141-146B / SSM-1-141-146B	596-647	5.59 / 7.81
SSMB-1-147 / SSM-1-147	648-1,190	3.03 / 4.24
SSMB-1-148A / SSM-1-148A	1,191-1,576	2.29 / 3.20
SSMB-1-147-146B / SSM-1-147-146B	1,577-1,690	2.14 / 2.99
SSMB-1-148A-146B / SSM-1-148A-146B	1,691-2,076	1.74 / 2.43



Model SSM-1

## 3" Deflection Series ★★☆☆

Model	Load Range (lbs)	'G' Rating
SSM-1-181	1-100	47.05
SSM-1-182	101-150	30.42
SSM-1-183	151-210	22.48
SSM-1-184	211-332	15.21
SSM-1-185	333-580	8.32
SSM-1-186	581-850	5.67
SSM-1-187	851-1,157	4.37
SSM-1-186-199	1,158-1,470	3.28
SSM-1-187-199	1,471-1,825	2.77

Select SSM-1 models instead of SSMB-1 models where higher 'G' ratings are required.

'G' ratings for SSMA-1 based on shake table testing at ISO 17025 accredited laboratory in accordance with ASCE 7-05 design parameters under OSHPD Special Seismic Certification Pre-Approval (OSP) program.

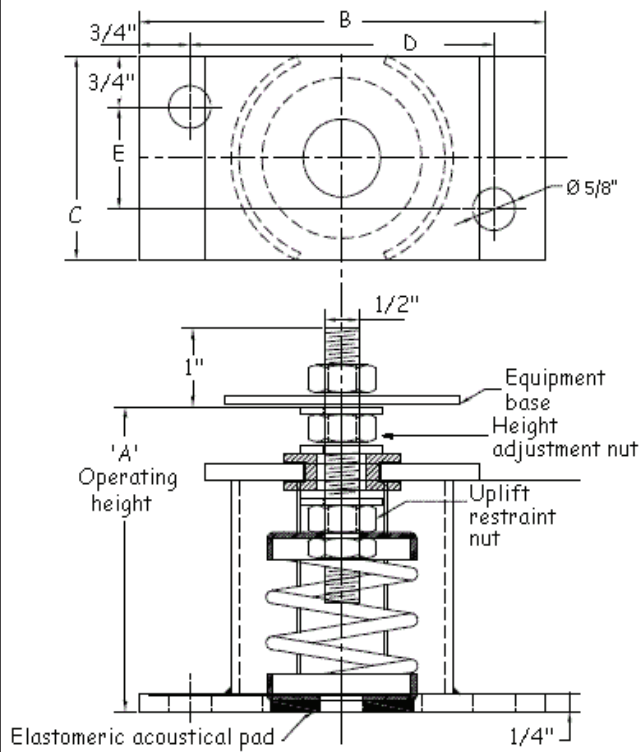
'G' ratings for SSM-1 and SSMB-1 based on attachment to steel. For concrete, ratings will be controlled by attachment methods & concrete strength.

★ Refer to page 11 for Isolator 5-Star Rating System

# SPRING MOUNTS - ALL-DIRECTIONAL RESTRAINT

## SSMA-1 / SSMB-1 Models

Powder coated housing (50-70 micron ASTM D4138-07a).

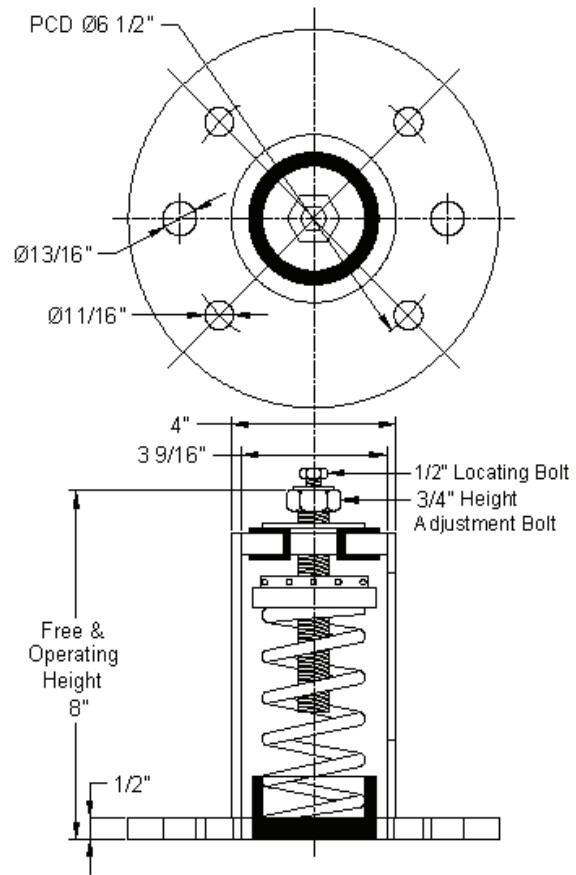


Housing will be elevated from ground when installed. Pull down to floor with anchor bolts.

Mount Series	Dimensions				
	A	B	C	D	E
SSMA-1	4 5/8"	6"	3"	4 1/2"	1 1/2"
SSMB-1	7 3/8"	7"	4"	5 1/2"	2 1/2"

## SSM-1 Models

Zinc metallized housing.



# VIBRATION ISOLATION PADS



- For floor mounted systems
- Wherever bolting is to be avoided and minor non-critical vibration conditions exist (pumps, motors, A/C units, generators, etc.)
- Simple field installation

## 3RFP Series ★★

Model	Size	Max Load (lbs)	Defl.
3RFP 181801	18" x 18" x 1"	22,680	.25"
3RFP 121201	12" x 12" x 1"	10,080	
3RFP 060601	6" x 6" x 1"	2,520	
3RFP 040401	4" x 4" x 1"	1,120	
3RFP 030301	3" x 3" x 1"	630	
3RFP 020201	2" x 2" x 1"	280	
3RFP 181802	18" x 18" x 2"	22,680	
3RFP 121202	12" x 12" x 2"	10,080	
3RFP 080802	8" x 8" x 2"	4,480	
3RFP 060602	6" x 6" x 2"	2,520	
3RFP 040402	4" x 4" x 2"	1,120	
3RFP 030302	3" x 3" x 2"	630	
3RFP 020202	2" x 2" x 2"	280	

## ECRMP Series ★

Model	Size	Max Load (lbs)	Defl.
ECRMP 181834	18" x 18" x 3/4"	19,440	.18"
ECRMP 060634	6" x 6" x 3/4"	2,160	
ECRMP 040434	4" x 4" x 3/4"	960	
ECRMP 030334	3" x 3" x 3/4"	540	
ECRMP 020234	2" x 2" x 3/4"	240	
ECRMP 010134	1" x 1" x 3/4"	60	

## SRMP Series ★★

Model	Size	Max Load (lbs)	Defl.
SRMP-2R 0606	6" x 6" x 13/16"	2,160	.22"
SRMP-2R 0404	4" x 4" x 13/16"	960	
SRMP-2R 0303	3" x 3" x 13/16"	540	
SRMP-3R 0606	6" x 6" x 1 1/4"	2,160	.33"
SRMP-3R 0404	4" x 4" x 1 1/4"	960	
SRMP-3R 0303	3" x 3" x 1 1/4"	540	
SRMP-2E 0606	6" x 6" x 1 9/16"	2,160	.36"
SRMP-2E 0404	4" x 4" x 1 9/16"	960	
SRMP-2E 0303	3" x 3" x 1 9/16"	540	
SRMP-3E 0606	6" x 6" x 2 3/8"	2,160	.54"
SRMP-3E 0404	4" x 4" x 2 3/8"	960	
SRMP-3E 0303	3" x 3" x 2 3/8"	540	

## RMP Series ★

Model	Size	Max Load (lbs)	Defl.
RMP 181838	18" x 18" x 3/8"	19,440	.11"
RMP 121238	12" x 12" x 3/8"	8,640	
RMP 060638	6" x 6" x 3/8"	2,160	
RMP 040438	4" x 4" x 3/8"	960	
RMP 030338	3" x 3" x 3/8"	540	
RMP 020238	2" x 2" x 3/8"	240	

## CRMP Series ★

Model	Size	Max Load (lbs)	Defl.
CRMP 181801	18" x 18" x 1"	19,440	.18"
CRMP 121201	12" x 12" x 1"	8,640	
CRMP 060601	6" x 6" x 1"	2,160	
CRMP 040401	4" x 4" x 1"	960	
CRMP 030301	3" x 3" x 1"	540	
CRMP 020201	2" x 2" x 1"	240	
CRMP 181802	18" x 18" x 2"	19,440	.20"
CRMP 121202	12" x 12" x 2"	8,640	
CRMP 060602	6" x 6" x 2"	2,160	
CRMP 040402	4" x 4" x 2"	960	
CRMP 030302	3" x 3" x 2"	540	
CRMP 020202	2" x 2" x 2"	240	

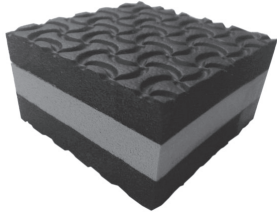
Contact us regarding non-standard sizes.

★ Refer to page 11 for Isolator 5-Star Rating System



# VIBRATION ISOLATION PADS

## 3RFP Series

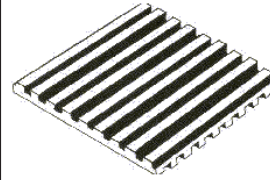


- Higher deflection than conventional pads
- Suitable/recommended for outdoor use; excellent resistance to oil, water, ozone
- Closed cell construction with excellent sound attenuation capability
- Free from sulfur, halogens, formaldehydes, phthalates, and other toxins
- Lifetime warranty against core separation

Maximum loading:  
70 psi

Material:  
Closed cell, chemically cross-linked HD rubber foam with LD core

## RMP Series

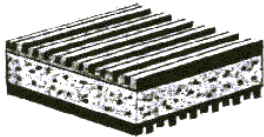


- Alternate high-low rib construction
- High quality ozone and water resistant elastomer

Maximum loading:  
60 psi

Material:  
55 duro elastomer blend

## CRMP Series

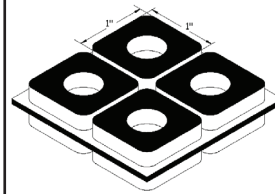


- Alternate high-low rib construction
- Environmentally friendly 100% natural cork core
- Excellent sound attenuation capability
- High quality ozone and water resistant elastomer

Maximum loading:  
60 psi

Material:  
Low density cork, elastomer blend

## ECRMP Series



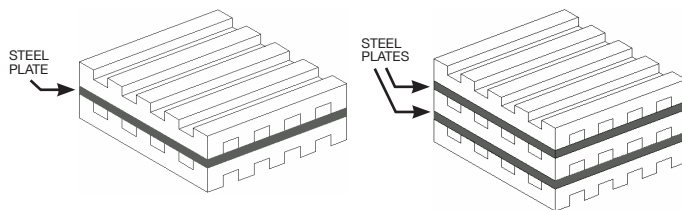
- New 1" modules offer greater versatility at jobsite to cut to exact size requirements
- Easy cut construction (by hand or utility knife)
- Waffle pad design with inbuilt suction cups
- High quality ozone and water resistant elastomer

Maximum loading:  
60 psi

Material:  
55 duro elastomer blend

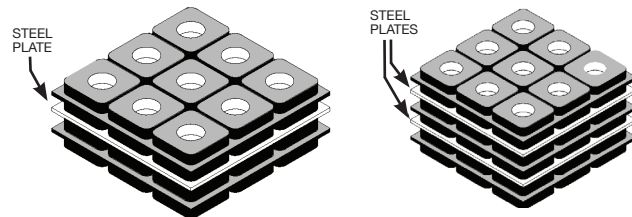
## SRMP Series

Alternate high-low rib construction:



- High quality ozone and water resistant elastomer

Waffle pad design with inbuilt suction cups:



Maximum loading: 60 psi

Material: 55 duro elastomer blend, galvanized steel plate

# RUBBER ISOLATORS - MOUNTS

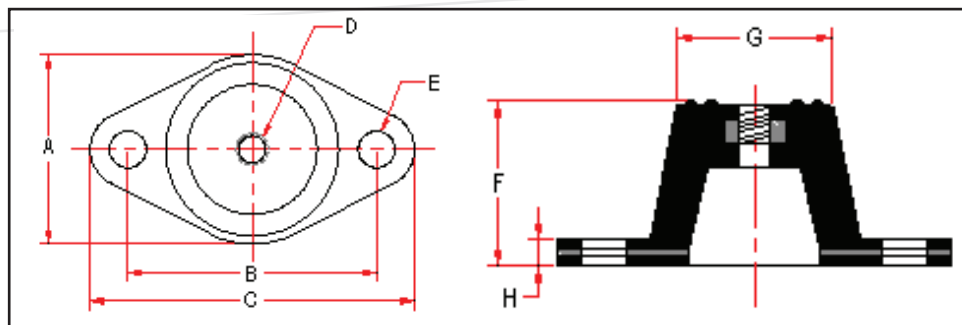


## Double Deflection, Rubber-in-Shear Mounts

- For suspended systems
- High deflection, low natural frequency
- Embedded steel plates for uniform loading
- Anti-skid top and bottom surfaces; mounting holes furnished as standard
- Ozone and water resistant elastomer
- Elements color-coded for easy field verification (by 'dot' or 'complete element')
- Optional lock-down bolt and washer available

### 0.5" Deflection Series ★★

Model	Load Range (lbs)	Isolator Dimensions (inches)								Color
		A	B	C	D	E	F	G	H	
FMD-A-1	1-30	1 3/4	2 3/8	3 1/8	5/16	11/32	1 1/4	1 3/8	3/16	BLUE
FMD-A-2	31-40									RED
FMD-A-3	41-70									GREEN
FMD-A-4	71-115									BLACK
FMD-B-1	116-130	2 3/8	3	3 7/8	3/8	11/32	1 3/4	1 3/4	7/32	BLUE
FMD-B-2	131-165									RED
FMD-B-3	166-235									GREEN
FMD-B-4	236-375									BLACK
FMD-E-3	376-400	2 3/8	3 1/8	4	3/8	1/2	2	1 3/4	1/4	GREEN
FMD-E-4	401-500									BLACK
FMD-F-1	501-750	3 5/8	4 3/4	5 7/8	1/2	9/16	3 1/2	2 3/4	3/8	BLUE
FMD-F-2	751-1,000									RED
FMD-F-3	1,001-1,500									GREEN
FMD-F-4	1,501-2,200									BLACK



★ Refer to page 11 for Isolator 5-Star Rating System

Models FMD-E and FMD-F have rectangular bases



Models FMD-A and FMD-B



Models FMD-E and FMD-F





# RUBBER ISOLATORS - LIGHT DUTY

## Light Duty Hangers

- For suspended systems
- Elements incorporate projected collar to prevent metal to metal contact between rod and bracket
- Includes steel cups / plates for uniform loading
- Ozone and water resistant elastomer
- AVHM series provides up to 17dB(A) noise reduction, and is designed for use with threaded rod
- HNW series designed for use with wire / strap

### AVHM Series ★

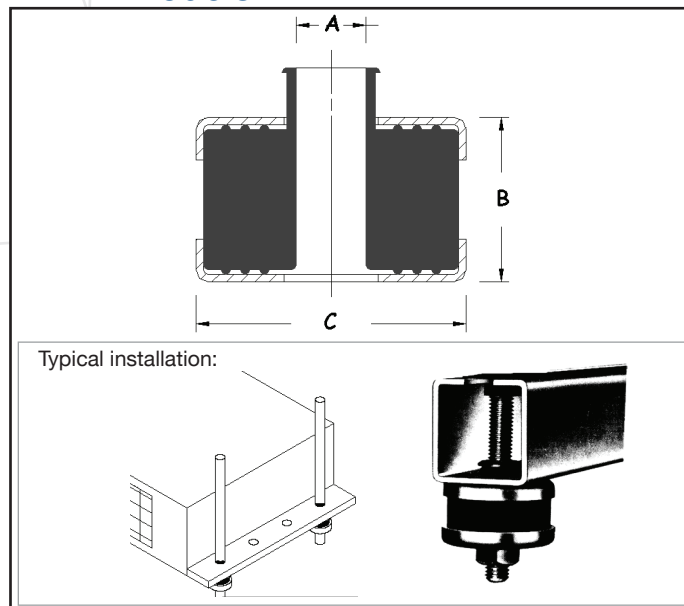
Model	Load Range (lbs)	Defl. (inch)	Dimensions (in.)		
			A	B	C
AVHM-50	1-110	.20"	7/16	3/4	1 9/32
AVHM-100	111-220	.20"	7/16	1 1/32	1 11/16

### HNW Series ★

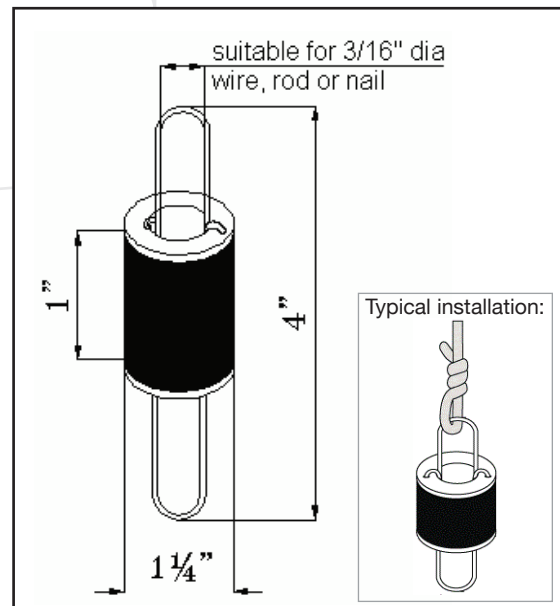
Model	Load Range (lbs)	Defl. (inch)	Color
HNW-1	1-65	.20"	RED
HNW-2	66-120	.20"	BLACK
HNW-3	121-200	.20"	BLUE

★ Refer to page 11 for Isolator 5-Star Rating System

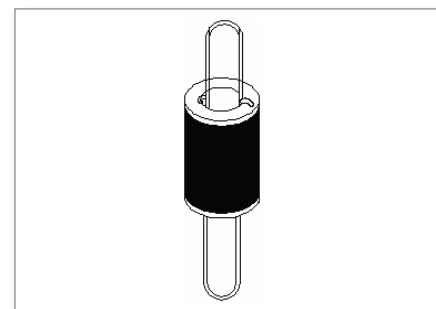
### AVHM Models



### HNW Models



Model AVHM



Model HNW

# RUBBER ISOLATORS - HANGERS



## Double Deflection, Rubber-in-Shear Hangers

- For suspended systems
- Powder coated steel bracket (50-70 micron ASTM D4138-07a)
- Element incorporates projected collar to prevent metal to metal contact between rod and bracket
- High deflection, low natural frequency
- Embedded steel plates for uniform loading
- Ozone and water resistant elastomer
- Elements color-coded for easy field verification (by 'dot/stripe' or 'complete element')

### 0.5" Deflection Series\* ★★

Model	Load Range (lbs)	Isolator Dimensions (inches)					Color
		A	B	C	D	E	
HND-A-1	1-30	3	1 3/8	2	2 1/4	1/2	BLUE
HND-A-2	31-40						RED
HND-A-3	41-70						GREEN
HND-A-4	71-120						BLACK
HND-B-1	121-165	4 1/2	1 7/8	2 1/4	3	5/8	BLUE
HND-B-2	166-235						RED
HND-B-3	236-375						GREEN
HND-B-4	376-572						BLACK
HND-C-3	573-745	6	3 1/4	3 1/2	4	5/8	GREEN
HND-C-4	746-1,307						BLACK
HND-D-2	1,308-2,240	6	3 1/4	4	4 1/2	3/4	RED
HND-D-3	2,241-3,000						GREEN
HND-D-4	3,001-4,200						BLACK

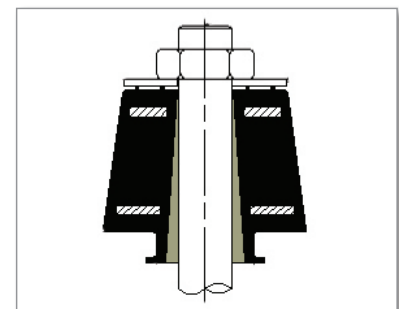


Model HND

\* HND-A series has nominal 0.4" deflection

### 0.5" Deflection Series\* ★★

Model	Load Range (lbs)	Isolator Dimensions (inches)								Color
		A	B	C	E	H	NH	N	NC	
HNDE-A-1	1-30	1 1/4	1 3/4	7/8	1/2	1 1/4	1/4	1 1/8	1 5/16	BLUE
HNDE-A-2	31-40									RED
HNDE-A-3	41-70									GREEN
HNDE-A-4	71-120									BLACK
HNDE-B-1	121-165	1 7/8	2 1/4	7/8	5/8	1 11/16	1/4	1 1/8	1 5/16	BLUE
HNDE-B-2	166-235									RED
HNDE-B-3	236-375									GREEN
HNDE-B-4	376-572									BLACK
HNDE-C-3	573-745	2 1/2	3 1/2	7/8	1/2	3 1/8	1/4	1 3/8	1 5/16	GREEN
HNDE-C-4	746-1,307									BLACK
HNDE-D-2	1,308-2,240	3	4	7/8	3/4	3 1/8	1/4	1 1/8	1 5/16	RED
HNDE-D-3	2,241-3,000									GREEN
HNDE-D-4	3,001-4,200									BLACK



Model HNDE

\* HNDE-A series has nominal 0.4" deflection

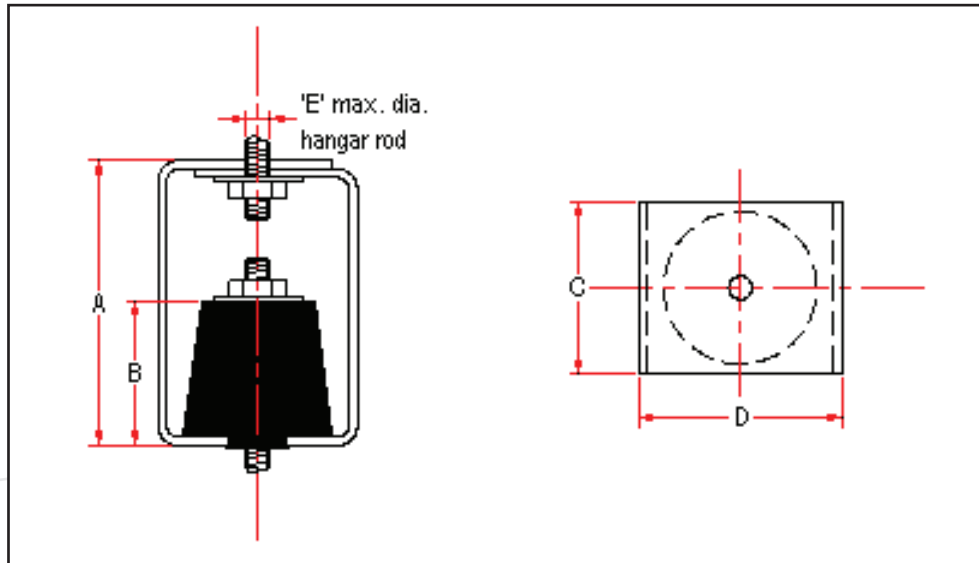
★ Refer to page 11 for Isolator 5-Star Rating System



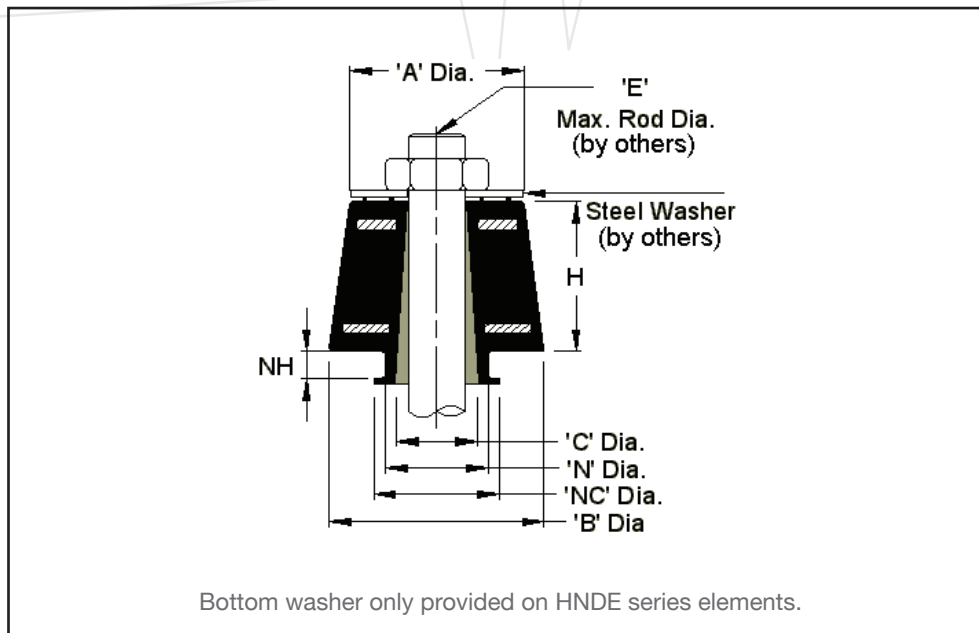
# RUBBER ISOLATORS - HANGERS

## Double Deflection, Rubber-in-Shear Hangers

### HND Models



### HNDE Models



# SPRING HANGERS



- For suspended systems
- Powder coated steel bracket (50-70 micron ASTM D4138-07a)
- Load distribution steel washer
- Nuts, washers, and rods by others
- Spring elements color-coded for easy field verification
- Seismic uplift restraint washer available as an option
- Consult spring chart on page 33 for isolator performance data

## 3/4" Deflection Series ★★☆☆

Model	Load Range (lbs)	H	E
HSS-021	1-25	1 13/16"	30°
HSS-022	26-55		
HSS-023	56-85		
HSS-024	86-125		

## 2" Deflection Series ★★★★★

Model	Load Range (lbs)	H	E
HSB-140	1-80	5 5/8"	28°
HSB-141	81-160		
HSB-142	161-310		
HSB-143	311-410		
HSB-144	411-595		n/a
HSB-141-146B	596-647		
HSB-147	648-1,190		28°
HSB-148A	1,191-1,576		n/a
HSB-147-146B	1,577-1,690		
HSB-148A-146B	1,691-2,076		

## 1" Deflection Series ★★★★★

Model	Load Range (lbs)	H	E
HSF-041	1-23	2 5/16"	23°
HSF-042	24-40		
HSF-043	41-65		
HSF-044	66-90		
HSF-045	91-185		
HSA-124	186-210	3 1/8"	46°
HSA-125	211-300		
HSA-126	301-370		
HSA-127	371-700	4 5/8"	28°
HSB-109	701-750		
HSB-110	751-910		
HSB-111	911-1,080		
HSB-112	1,081-1,250	4 1/8"	34°
HSD-158	1,251-1,500		
HSD-159	1,501-2,082		n/a
HSD-159-161	2,083-2,603		

## 3" Deflection Series ★★★★★★

Model	Load Range (lbs)	H	E
HSE-181	1-100	6 1/2"	30°
HSE-182	101-150		
HSE-183	151-210		
HSE-184	211-332		
HSE-185	333-580		
HSE-186	581-850		
HSE-187	851-1,157		
HSE-186-199	1,158-1,470		
HSE-187-199	1,471-1,825		

★ Refer to page 11 for Isolator 5-Star Rating System



# SPRING HANGERS

Technical drawing of a spring hanger. The top view shows a square frame with dimensions B (width) and C (height). The side view shows the internal components: a central rod with nuts and washers, an elastomeric washer, and a spring. Dimension A is the total height of the hanger. Dimension E is the diameter of the spring. Labels include: 'D' max. dia. hangar rods + nuts + washers (by others), Elastomeric washer, Spring, and 'H' Free Height.

Hanger Series	Dimensions (inches)			
	A	B	C	D
HSS	2 23/32"	2 5/32"	1 1/2"	1/2"
HSF	3 15/32"	2 5/32"	1 1/2"	1/2"
HSA	4 1/2"	3"	2 1/4"	5/8"
HSB	7 1/2"	3"	2 3/4"	5/8"
HSD	6 3/8"	3 1/2"	2 3/4"	3/4"
HSE	8 3/4"	3 1/2"	2 3/4"	3/4"



Models HSS / HSF / HSA / HSB / HSD / HSE

# SPRING HANGERS - NEO-SPRING



## Combination Neo-Spring™ Hangers

- For suspended systems
- Powder coated steel bracket (50-70 micron ASTM D4138-07a)
- Load distribution steel washer and embedded steel plates
- Ozone and water resistant elastomer elements with embedded steel plates and incorporated projected collar to prevent metal to metal contact between rod and bracket
- High deflection, low natural frequency
- Spring / rubber elements color-coded for easy field verification
- Seismic uplift restraint washer available as an option
- Consult spring chart on page 33 for isolator performance data

### 1" Deflection Series ★★☆☆

Model	Load Range (lbs)	H1	H2	E
HNSF-HM-041	1-23	1"	2 5/16"	23°
HNSF-HM-042	24-40			
HNSF-HM-043	41-65			
HNSF-HM-044	66-90			
HNSF-HM-045	91-185			
HSB-HM-124	131-210	1"	3 3/8"	46°
HSB-HM-125	211-300			
HSB-HM-126	301-370			
HSB-HM-127	371-700			
HSB-HM-109	701-750	1"	4 5/8"	28°
HSB-HM-110	751-910			
HSB-HM-111	911-1,080			
HSB-HM-112	1,081-1,250			

### 2" Deflection Series ★★★★★

Model	Load Range (lbs)	H1	H2	E
HSB-HM-140	1-80	1"	5 5/8"	28°
HSB-HM-141	81-160			
HSB-HM-142	161-310			
HSB-HM-143	311-410			
HSB-HM-144	411-595			
HSB-HM-147	648-1,190			

### 2.5" Deflection Series ★★★★★

Model	Load Range (lbs)	H1	H2	E	
HNSB-A4-140	1-80	1 1/4"	5 5/8"	28°	
HNSB-B1-141	81-160	1 3/4"			
HNSB-B3-142	161-310				
HNSB-B4-143	311-410				
HNSB-C3-144	411-595	3"			
HNSB-C3-141-146B	596-647				n/a
HNSB-C4-147	648-1,190				28°
HNSB-D2-148A	1,191-1,576				n/a
HNSB-D2-147-146B	1,577-1,690				
HNSB-D2-148A-146B	1,691-2,076				

### 1.5" Deflection Series ★★★★★

Model	Load Range (lbs)	H1	H2	E		
HNSA-A3-121	1-50	1 1/4"	3 3/8"	46°		
HNSA-A4-122	51-80					
HNSA-B1-123	81-130	1 3/4"				
HNSA-B2-124	131-210					
HNSA-B3-125	211-300					
HNSA-B3-126	301-370					
HNSA-B4-127	371-582	3"			4 5/8"	28°
HNSB-C3-108	583-620					
HNSB-C4-109	621-750					
HNSB-C4-110	751-910					
HNSB-C4-111	911-1,080					
HNSB-C4-112	1,081-1,250					
HNSE-D2-158	1,251-1,500		4 1/8"	34°		
HNSE-D2-159	1,501-2,082					
HNSE-D3-159-161	2,083-2,603					

### 3.5" Deflection Series ★★★★★

Model	Load Range (lbs)	H1	H2	E	
HNSE-A4-181	1-100	1 1/4"	6 1/2"	30°	
HNSE-B1-182	101-150	1 3/4"			
HNSE-B2-183	151-210				
HNSE-B3-184	211-332				
HNSE-C3-185	333-580	3"			
HNSE-C4-186	581-850				n/a
HNSE-C4-187	851-1,157				
HNSE-D2-186-199	1,158-1,470				
HNSE-D2-187-199	1,471-1,825				

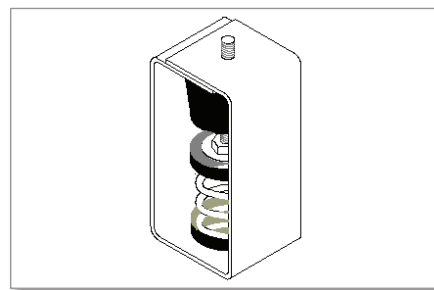
★ Refer to page 11 for Isolator 5-Star Rating System



# SPRING HANGERS - NEO-SPRING

## Combination Neo-Spring™ Hangers

Hanger Series	Dimensions (inches)			
	A	B	C	D
HNSF-HM	4 27/32"	2 5/32"	1 1/2"	3/8"
HSB-HM	7 1/2"	3"	2 3/4"	3/8"
HNSA-Ax	8"	3"	2 3/4"	1/2"
HNSA-Bx	8"	3"	2 3/4"	5/8"
HNSB-Ax	10 3/16"	4 1/2"	4"	1/2"
HNSB-B/C/Dx	10 3/16"	4 1/2"	4"	5/8"
HNSE-Ax	11 13/16"	4 1/8"	4"	1/2"
HNSE-B/Cx	11 13/16"	4 1/8"	4"	5/8"
HNSE-Dx	11 13/16"	4 1/8"	4"	3/4"



Models HNSA / HNSB/ HNSD /  
HNSE / HSB-HM

# VIBRATION ISOLATION ACCESSORIES



## Expansion Joints

Serve to reduce noise and vibration transmission as well as eliminate stress due to thermal expansion and piping misalignment. Made with corrosion-resistant materials, and can be easily installed in the field.

### Rubber Bellow Type Expansion Joints

- Precision molded of synthetic rubber; synthetic fiber reinforcement
- Union/Screwed Connection: threading standard as per customer specifications (NPT, BSPT)
- Flanged Connection: floating flanges drilling standards as per customer specifications (ANSI, BS, DIN, JIS)
- Applicable fluids for standard construction: water (cold, hot, or sea), weak acids, alkalis, compressed air, etc.
- Different elastomers available for other fluids (i.e. oil)
- Single and twin bellow models available

### Stainless Steel Bellow Type Expansion Joints

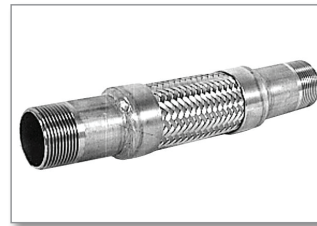
- Vibration absorption and piping misalignment correction
- Engineered below design ensures equal stress distribution through entire length
- Threaded connection and flanged connection models available



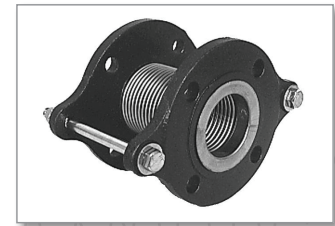
*Rubber Bellow  
(union / screwed connection)  
Models FCU / FCU-SH / FCU-TH*



*Rubber Bellow  
(flanged connection)  
Models FCS / FCT*



*Stainless Steel  
(threaded connection)  
Model JF-500-T*



*Stainless Steel  
(flanged connection)  
Model JF-500 / JF-500-H*

## Floating Floors / Air Mounts / Bases / Rails

### Floating Floors

- Controls airborne sound transmissions when the standard structural floor is not sufficient to prevent noise from mechanical rooms from passing into noise-sensitive areas above or below it
- Form-work floating floor construction accommodates thicker floating floors with correct isolator selection, and offers a fiberglass infill which, in addition to preventing a sound tunneling effect, provides extra transmission loss

### Air Mounts

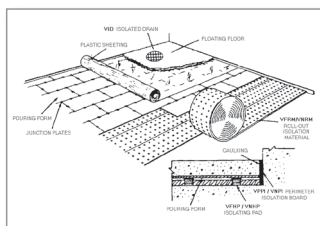
- Air-cushioned isolation, low natural frequency, high deflection, and high lateral stability
- Neoprene padded top and bottom base and heavy wall construction
- Combined resiliency and air prevents drift or permanent set

### Inertia Bases

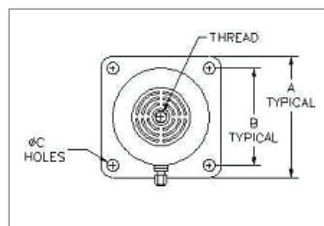
- For use in supporting mechanical equipment requiring a reinforced concrete inertia base
- Specifically designed and engineered to receive poured concrete

### Roof Curb Isolation Rails

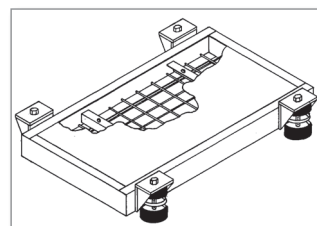
- Designed and engineered as a vibration control system for curb mounted equipment installed on the roof
- Lightweight and weatherproof



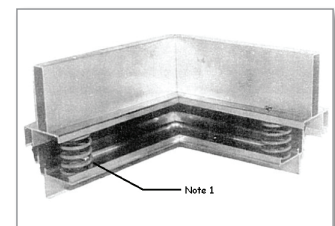
*Floating Floors*



*Air Mounts*



*Inertia Bases*



*Roof Curb Isolation Rails*



Spring No.	Color		RL * (lbs)	SL * (lbs)	Deflection at SL (inches)	Spring Constant (lbs / inch)	O.D.	FSH *	Rating
	Main	Stripe							
021	SILVER	BLUE	20	30	0.75	40	1 1/4	1 1/2	★ ★ ★
022	SILVER	RED	44	66	0.75	88			
023	SILVER	YELLOW	70	105	0.75	140			
024	SILVER	WHITE	100	150	0.75	200			
041	SILVER	BLUE	14	22	1.55	15	1 1/4	2 1/4	★ ★ ★
042	SILVER	RED	34	51	1.50	34			
043	SILVER	YELLOW	57	86	1.40	62			
044	SILVER	WHITE	70	106	1.25	85			
045	SILVER	PINK	144	216	1.30	167			
101	SILVER	PINK	56	85	1.40	61	2	4	★ ★ ★
102	SILVER	BLACK	76	115	1.30	89			
103	SILVER	BLUE	113	170	1.30	131			
104	SILVER	YELLOW	150	225	1.30	174			
105	SILVER	BROWN	216	325	1.20	271			
106	SILVER	RED	300	450	1.20	375			
107	SILVER	PURPLE	400	600	1.20	500			
108	SILVER	ORANGE	500	750	1.10	682			
109	SILVER	GREEN	600	900	1.00	900			
110	SILVER	GRAY	733	1,100	0.80	1,375			
111	SILVER	WHITE	866	1,300	0.80	1,625			
112	SILVER	GOLD	1,000	1,500	1.00	1,500			
113	SILVER	NIL	466	700	1.00	700			
121	SILVER	BLUE	40	60	1.30	47	2	2 3/4	★ ★ ★
122	SILVER	ORANGE	66	100	1.30	77			
123	SILVER	BROWN	110	165	1.20	138			
124	SILVER	BLACK	173	260	1.00	260			
125	SILVER	YELLOW	246	370	0.80	463			
126	SILVER	RED	300	450	0.50	900			
127	SILVER	GREEN	560	840	1.15	731			
140	SILVER	BLUE	66	100	2.25	45	2	5	★ ★ ★ ★
141	SILVER	BLACK	133	200	2.25	89			
142	SILVER	RED	250	375	2.00	188			
143	SILVER	GREEN	333	500	2.00	250			
144	SILVER	GRAY	476	714	2.00	357			
147	SILVER	WHITE	953	1,430	2.00	715			
148A	SILVER	YELLOW	1,261	1,892	2.00	946			
146B	SILVER	WHITE	400	600	2.00	300	1 1/4		
150	SILVER	BROWN	83	125	1.30	97	2 1/2	3 5/8	★ ★ ★
151	SILVER	ORANGE	150	225	1.30	174			
152	SILVER	GREEN	216	325	1.20	271			
153	SILVER	RED	300	450	1.20	375			
154	SILVER	BLACK	400	600	1.20	500			
155	SILVER	WHITE	500	750	1.10	682			
156	SILVER	GRAY	600	900	1.00	900			
157	SILVER	BLUE	733	1,100	0.90	1,223			
158	SILVER	GOLD	1,200	1,800	1.00	1,800			
159	SILVER	NIL	1,666	1,666	1.00	2,500			
161	SILVER	RED	416	625	1.00	625	1 5/16		
181	SILVER	PINK	86	130	4.30	30	2 1/2	6	★ ★ ★ ★
182	SILVER	GREEN	133	200	4.00	50			
183	SILVER	BLUE	180	270	3.60	75			
184	SILVER	YELLOW	266	400	3.20	125			
185	SILVER	BROWN	486	730	3.60	200			
186	SILVER	RED	713	1,070	3.00	350			
187	SILVER	WHITE	926	1,390	3.00	464			
199	SILVER	BLACK	533	800	3.00	267			

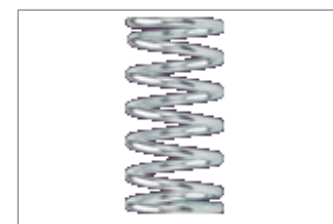
# SPRINGS

- Electroplated steel in accordance with ASTM B633-13 Type II, Class 2
- High deflection, low natural frequency
- Springs should be selected in the range of -30% to +25% of rated load (RL)

\* SL: = Load at which spring will become solid or theoretical maximum load

RL = Rated load based on ASHRAE defined 50% additional travel to solid

FSH = Free spring height



# GRIPPLE SEISMIC PROJECTS



Gripple® Seismic has been specified on many prestigious construction projects across North America, for both new and retrofit installations, in order to enhance the stability of nonstructural equipment and components during a seismic event. Types of equipment and services that have been braced with Gripple® Seismic include: VAV boxes, sprinkler pipe, electrical cable tray, junction boxes, lighting, ductwork, plumbing, fan coil units, and more.

Below is a sampling of projects where Gripple® Seismic Cable Bracing systems have been installed. For more information or details regarding completed projects, please contact the Gripple Territory Manager in your region.

## Research/Labs

- Abbott Laboratories
- Integra, Life Sciences Biopatch Facility
- Janssen Ortho Tapentadol
- Montsantos
- Pioneer/DuPont Bioagriculture R&D Lab
- Sartorius Stedim Biotech
- UCSF Neurological Building

## Healthcare

- Alton Memorial Hospital
- AtlantiCare Regional Med. Ctr.
- Belleville Hospital
- Evergreen Cancer Center
- Hoag Hospital
- Kadlec Medical Building
- Kaiser Permanente - South Baltimore Medical Center
- Kennewick General Hospital
- Medical College of Virginia - Labor & Delivery
- Milgard Medical
- Mission Bay Hospital
- Procure Medical
- Rainier Tower
- San Jorge Childrens Hospital
- St. Anthony's Hospital
- US Veterans Hospital
- VA Outpatient Clinic
- Virginia Breast Center - Bon Secours Medical Group
- Wishard Hospital

## Manufacturing

- Abbott Vascular
- Anchorage Sport Fish Hatchery
- Boeing 737 Plant
- Caterpillar Plant
- Dupont Febreze Facility
- Elliott Bay Brewery
- EngerG2
- Global Foundries
- Intel
- Kruger Paper
- Monroe Waste Water Treatment Plant
- Tillamook County Creamery
- Warner Chilcott

## Government/Military

- Elmendorf Air Force Base
- Fort Benning
- Fort Buchanan
- Fort Hunter Liggett
- Kanata Fire Station
- National Archives and Records Administration (NARA)
- Naval Surface Warfare Center
- Ontario Provincial Police
- Puerto Rico National Guard Armed Forces Reserve
- Scott Air Force Base
- TVF & R Fire Station
- Veterans Affairs Parking Garage

## Entertainment

- Golden Nugget Hotel/Casino
- Seminole Indian Tribe Hard Rock Casino Parking Garage

## Educational

- Algonquin College
- Baker Middle School
- Eastmont High School
- Joseph Gale Elementary
- Sharbot Lake School
- Sterling Middle School
- Trillium Creek School
- Woodburn Elementary

## Office & Retail

- Air Canada Operations Centre
- Amazon.com
- Chevron Oil Company
- Edward Jones South Building
- Forever 21 Store, Plaza Del Caribe
- Glumac TI
- IKEA Montreal
- Siemens
- Tivoli Village

## Data Storage

- Microsoft Columbia Data Center
- Pillar 2 (Prineville, OR)
- Riker Data Center

## Additional Projects

- Grace Bible Church
- Manhattan Community Garage
- Metropista de Puerto Rico
- Mother C. Hale Bus Depot
- Perris Station Sr. Apartments
- St. Andrews Lutheran Church





# OUR COMPANY

Gripple is an award-winning company that continues to grow on the strength of its focus on innovation. Gripple's original product was launched in Sheffield, England in 1988 to the Agriculture market, and was a joiner/tensioner to secure wire for fencing and trellising. A few years later, Gripple introduced the Construction industry to load-rated cable hanger kits for suspending and bracing HVAC, Mechanical, Lighting, and Electrical services in a much quicker, safer, and easier manner than other traditional methods. Driven by a problem-solving attitude and determination to innovate, the Gripple product range has continued to expand year after year, offering customers a vast array of revolutionary suspension methods.



*Gripple in the Agricultural industry*

Several years ago Gripple began the extensive research, development, and product testing for Gripple® Seismic. Gripple® Seismic provides turn-key seismic solutions for nonstructural building components including cable bracing kits, vibration isolation products, estimating services, and licensed engineering.

“...the Gripple product range has continued to expand year after year, offering customers a vast array of revolutionary suspension methods.”

Today, over 400 million Gripple products have been sold in more than 70 countries worldwide, and the company has manufacturing facilities in the UK and USA, offices in France, Germany, Italy, Spain, and India, and representation around the world. With its solution-driven products, product knowledge, and customer service, Gripple is well placed to continue leading the way in the industry.



*Gripple in the Construction industry*



*Gripple Ltd., Sheffield, UK*



*Gripple Inc., Aurora, IL, USA*



*Gripple S.à.r.l., Obernai, France*

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